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# EDITORIAL.

## THE ANNUAL MEDICAL REVIEW NUMBER.

### Review of Medical Literature for 1907.

A review of the immense amount of original literature produced by the prolific writers of this rapid age is entirely beyond the capabilities of any one man. To keep familiar with only the best work done in any one line taxes the limited time devoted entirely to this task of those men restricting themselves to special fields. Yet the absolute necessity of keeping abreast with medical progress is now, more than ever before, appreciated by the entire medical profession. These conditions have produced many publications covering the literature of a given time, in a more or less condensed or abstract form. Year books, issued quarterly or monthly, have attempted to supply the demands for this much desired knowledge. Up to the present time, however, with the exception of the Interstate, no medical journal has undertaken the burden of giving a systematized review of the literature as an annual number of its regular edition. The priority of these review numbers covering every cognate branch of medicine has been undisputed. In 1902 the Interstate inaugurated this annual review, and the growing favor with which it has been received since that time, more than compensates for the continued efforts represented by each January number. The present number is the sixth annual review of medical progress issued by the Interstate, and with its presentation the following editorial comment may not be amiss.

This work involving a detailed amount of labor has been more than merely a review of the literature in each special branch of medicine. On the contrary, besides reviewing the literature, the special departments have conscientiously endeavored, by eliminating all extraneous material, to compile only the valuable productions of the year so as to set forth new departures or diversions, to readjust or correct old principles, and to corroborate or sustain established procedures. In doing this, however, the personalities of the authors have been completely eliminated, and the conclusions have been deducted entirely from the mass of authoritative opinion found in the literature. No claim is made for completeness in

any one individual review, although the work of the review taken in conjunction with the abstracts in the monthly issues of each department, include the most important original work of the year done in any one special branch.

Granting that mere translation and synopses, with the proper compilation thereof, represent one of the lowest grade of medical writing, no pretense of originality is assumed. A review of these reviews, however, will demonstrate that their purpose has been a more elevating one than that of mere summarization and condensation of medical material. By collecting and systematizing the medical facts discovered during the year they attempt to depict the progressive advancement being made in the respective divisions of medical work. In doing this a two-fold object is accomplished. A retrospection of the actual work performed is detailed, and a prospection of that work drawn from critical comparison and control.

The relative value of the non-prejudiced view of the application of the knowledge drawn from past medical experience advanced by one year's conclusions is inestimable. Reference to the work done previous to the annual review is only included in so far as its general importance applies to the work of the year. The retrospective aspect of any one division of work demonstrates the inter-relationship and the development therefrom of principles being advanced step by step. The prospective standardization of an entire year's work is perhaps the most beneficial result derived from these reviews. For example, the comparison of one test by a number of authorities under the same condition is the only means of establishing the value of that individual test. This is the only absolute balance upon which hangs the poise of science. And last, the tendencies of future development exhibited by the trend of even one short year's work is a most stimulating influence for the original worker, whether he be the investigator of the laboratory or the progressive clinician. In endeavoring to project these reviews, attempting the above purposes, the INTERSTATE is desirous of fulfilling the present day journalistic obligations as well as meeting the demands of an exceedingly ambitious and rapidly progressive profession.

# ORIGINAL ARTICLES.

## THERAPEUTICS.

By William Engelbach, M. D.

This review of the past year's literature intends to consider only the most important contributions on the therapy of the infectious, respiratory, cardio-vascular, gastrointestinal, kidney and blood diseases. Articles already reviewed in this department during the year have not been included.

The most important advancement of therapeutics in the past year has been directed along three lines: (1) The creation of renewed interest and investigation in pharmacotherapy; (2) a more accurate control of the composition and action of therapeutical agents; and (3) a marked tendency to a more simple therapy.

For the last two decades coincident with the rapid discoveries of biologic workers serum-therapy has commanded the attention of the original workers along the lines of immunity and its specific application to the curative treatment of disease. Stimulated by the brilliant results obtained from serum-therapy in a few diseases, investigators have directed all their efforts to apply the theories of serum immunity to the treatment of other abnormal conditions. Granting that the achievements in this line of work have not lagged during the past year, no remarkable discoveries have been noted. With few exceptions the advance in serum-therapy has been more in its application, *i. e.*, the perfection of production, technique and new indications of known serums. Several new communications on anaphylaxis concerning the effect of reinoculations of serum have been brought out by Nicolle[1] and others. These have demonstrated the hypersensitiveness of an organism to a serum with which it has previously been inoculated. The local phenomenon, as described by Arthus, is that the injection of 5 cc. of horse serum, fresh or heated to 56 degrees C., subcutaneously, intraperitoneally or intravenously, into a rabbit every six days the absorption of the liquid becomes gradually slower, beginning with the fifth injection. From the sixth injection there forms locally a thick, whittish, aseptic exudate which persists for many weeks. With the seventh the process becomes that of a typical scar or necrosis and ulceration. This is purely a local process due to the inoculation of the same amount of serum in the same location at regular intervals. Complete anaphylaxis is produced by inoculating a minimal dose of serum, 1-100 to 1-200 mg., into an animal. This one inoculation produces a substance in the blood which has been called anaphylactin, and the rabbit is then sensitized to a larger dose (5 cc.) of the same serum. When this is given two weeks after the initial dose a sensitized animal will either die suddenly with symptoms of exaggerated respiration and convulsions,

or it may apparently recover from these symptoms which are then followed by cachexia. It is evident that this research will have an important bearing upon the future of serum-therapy.

The enthusiasm which has been stimulated by the results obtained from vaccine and serum-therapy has been responsible for the little attention devoted to the cure of diseases by drugs of definite composition or chemical therapeutics. The rejuvenation of investigation in pharmacology is perhaps one of the natural reactions to be expected. The scientific interest which has been produced abroad by the enlivening of the older principles of drug therapy is due much perhaps to the work of Ehrlich, who did so much to start investigation in curative sera. Appreciating the opportunity presented by this great field of investigation, he is now using a large endowment for the experimental therapy of drugs. He with Bechold has already published several important communications (experimental trypanosomasis) from the Institute of Frankfurt. Other German universities, Freiburg and Berlin, realizing the importance of the revived energies in chemical therapy, have commenced to develop their pharmacological departments. This interest also exists in England, shown by the new laboratory for Cushney, Professor of Pharmacology in the University College, London, for the advancement of experimental pharmacology. Prof. Dixon of King's College has also done much to stimulate interest in pharmacologic standardization of drugs. At least one large English manufacturing house has established a well equipped laboratory for experimental pharmacology and placed it under the direction of well trained pharmacologists. The developments abroad can but impress upon our own universities the necessity of the present time, that of a more thorough training in pharmacology, for the inclination in the past year would indicate that pharmacotherapy will be a subject which is to be rapidly developed. With the exception of the University of Michigan, Western Reserve and University of Chicago, the universities of the country have incompetent organizations in this department.

Better control of remedies has received marked attention in this country through the remarkably effective work of the Council on Pharmacy and Chemistry. This department of the Americal Medical Association has done a great deal to determine the actual constituents of remedies which have been recommended to the profession. It staands today as an impartial court giving out positive information concerning all the remedies which have been subjected to its investigation. It has already proven of inestimable value and its influence will increase according to the demand made by the profession for its approval of all preparations offered for use. The government Department of Agriculture, in charge of Dr. Wiley, through the enforcement of the pure food law has introduced measures in the past year which will be far-reaching in their indirect influence for a more scientific therapy. The general tendency of the better medical journals to exclude non-ethical preparations from their advertising departments has been brought about by the almost organized fight on nostrums. The movement against this great evil has extended from medical literature into the popular magazines and periodicals. Adams' series of

articles were remarkably fruitful in demonstrating the great danger to which the laity is subjected by the commercial traffickers in human life. The commercial value of discoveries in pharmacy has been so great that pharmaceutical houses have increased to a remarkable number. Many of these institutions exist almost entirely upon the royalties of patented drugs which depend entirely for their sale upon systematized advertising. Nearly all of them have adopted the method of patenting preparations which have been discovered and given to the profession by original investigators. Few, if any, represent any original discoveries for which they are personally responsible. The suggestion of a German investigator that the laboratories making discoveries of important preparations should patent those preparations, would do much to direct the profits made from these patent preparations toward advancing more scientific research.

The delivery from polypharmacy with the employment of simpler physical and psychical means in therapy, as expounded by Thayer,[2] is one of the most healthful articles of the year. He points out the important changes which have taken place in the practice of medicine as a result of the development of more scientific methods, as follows: (1) The use of drugs the physiologic action of which is understood and can be controlled; (2) the use and development of unquestionable specifics; thyroid extract in the treatment of myxedema, antitoxin of diphtheria and tetanus, vaccines against typhoid, dysentery and plague, preventive treatment of yellow fever, malaria, plague and cholera; (3) the investigations of Ehrlich and his students as to the manner of action of various chemical substances in different infections; (4) careful application of more simple physical and mental methods of treatment. He says: "Everywhere there are signs of reawakening of therapeutic enthusiasm—an enthusiasm based on the fact that the seeds that science has so patiently and sedulously sown are germinating and bringing forth a new therapeutic art born of research and experiment, accurate thinking and reasoning—widely different from the blind empiricism of the past."

*Infectious diseases.*—An immense amount of work has been published upon the serum treatment of infectious diseases of known etiology controlled either by laboratory (opsonins) or clinical methods. All the reports have been more or less favorable, but the method of administering the serum and the control of the inoculations have varied considerably. The consensus of opinion seems to be leaning towards the impracticability of Wright's method and to favor the clinical method. From his personal experience with Wright's method of treatment, Ohlmacher[3] concludes that the proper artificial autoinoculations will produce results in the constitutional and local improvement in many subacute and chronic infections entirely beyond anything previously possible in medicine; that they are therapeutic agents of a specificity and potency exceeding anything heretofore employed in the treatment of disease, except possibly the antitoxin of diphtheria. Potter,[4] after a very exhaustive comparative estimation of opsonins due to different organisms, concludes as fol-

lows: (1) Wright's method of indicating the opsonic indices in bacterial infections is hardly accurate enough to compensate for the amount of time involved in its application. There is a general parallelism, however, between the opsonic indices and the clinical course of most cases, so that these determinations should be made when the results of inoculation cannot be controlled by the ordinary clinical methods of observation, when there are several organisms present and when the patient does not improve from the usual method of inoculation. (2) Its variation depends upon (a) difference in normal serum, so that even when the counts varied on the average two, three or more supposedly normal sera it is not possible to prevent variations of 10 per cent to 30 per cent; (b) difference depending upon the source of the leucocyte; and (c) differences depending upon counting different areas of the slide. (3) Leucocytes from patients the subjects of bacterial infections do not always agree in the phagocytic activity with those from normal individuals. (4) Inoculation of dead cultures of homologous or heterologous bacteria is helpful or curative in many local infections. (5) It is probable that the response to inoculation can be easily exhausted by too large and frequent doses, and it is very doubtful if advanced cases can be completely cured by inoculation.

*Tuberculosis.*—Trudeau[5] points out the possibility of immunizing animals with tuberculin. To a certain degree best results are obtained by the use of living bacilli, although germ-free products and killed bacteria also have some value. Various antibodies are thus produced causing immunity, but as yet no exact measure of the degree of immunity or reliability of the dose of infectious material necessary for its production has been established. Calmette demonstrated that the nature of the process of invasion is dependent upon the number of bacilli produced and the interval of inoculation. Small amounts of bacilli are arrested by leucocytes, whereas large amounts, or repeated inoculations in small amounts, results in general infection. At present Koch's emulsion of crushed virulent tubercle bacilli (tuberculin B. E.) and filtrates of human cultures, such as Deny's tuberculin B. F., are used extensively. Regarding the opsonic index, Trudeau's observations are that, leaving aside the difficulties and sources of error in the determination of the index, as yet it is not established as a reliable criterion of immunity, because opsonins constitute only one of the active bodies produced in immunity reactions. The clinical method aims gradually to produce immunity to tuberculin without demonstrable clinical reactions or disturbance. He points out that it is possible to produce strong immunity to tuberculin without any violent or local reaction. He begins with extremely small doses, .0001 mg. The dose is then gradually increased with intervals of four or five days. If no intolerance develops it may require six months to a year before a high degree of immunity is reached. Immunity is always produced very slowly. If a clinical reaction appears at any time the injections are suspended and later commenced with smaller quantities, gradually increasing. In this way immunization is carried to a dose of 1 cc. with advantage, but this size dose should not be carried on

indefinitely, as the power to resist the effort may be exhausted. Trudeau treats in this way only cases free or nearly free from fever. The more chronic the case the better appears to be the result. From his personal experience he says the more familiar one becomes with the varying course of tuberculosis, the easier it is to realize the difficulty of setting forth any positive evidence as to the favorable influence *per se* of any specific treatment when so many other factors influence the course of a disease, itself so erratic and varying in its manifestations. He points to the evidence of his statistics, however, to show that patients treated with tuberculin during the past fifteen years, from 18 to 25 per cent more were alive than those not treated with tuberculin. Grigoroff[6] prepared a vaccine by the means of diastases derived from saprophytic microbes of which he found the amylobacter admirably adapted, and related that living or dead tubercule bacilli treated with cultures of the amylobacter became disintegrated so that they readily succumbed to the phagocytosis. Tubercle bacilli thus treated presented both a curative and a preventive action in experiments on guinea pigs and rabbits. He demonstrated that this vaccine had a marked preventive action by the fact that after injection of the infectious bacilli into guinea pigs, the injection of the vaccine never failed to arrest the course of the infection. Of 100 patients Hammer[7] reports 60 benefited by tuberculin treatment. He commences with .000001 increasing to .00001 and then to ,0001 gm. of tuberculin, and so on till in the course of 55 injections the total amount of 5.9 mg is given. His idea was always to keep on the border line of the clinical reaction. Reviere[8] and many others report very good results, after extended time in many cases, in tuberculin treatment of all forms of tuberculosis with the opsonic determination.

Knopf[9] describes in detail the very practical appliance of a window tent which allows the patient to be within the room and yet receive the benefits of the fresh air treatment. This is very highly recommendable, especially for the winter season, when one meets with considerable difficulty in getting patients to take the open air treatment. The value of the crusade against tuberculosis which is being made by the present campaign of education is attested by the support which is being afforded by civic, state and national authorities. The value of sanatoriums in the antituberculosis movement is fully taken up by King,[10] who summarizes by saying that sanatoriums afford the tuberculous invalid the most practical and systematic method of fighting his disease, besides acquiring hygienic education in its prevention. In these relationships it possesses a scope and value of vital importance in the present great antituberculosis movement.

The French observers have shown by experiments on dogs that amyl nitrite strongly contracts the pulmonary vessels and that the contraction persists for about ten minutes. Hare reports some 34 cases of his own and of others, in all but one of which amyl nitrite, in doses of from 3 to 9 minims, promptly controlled the hemorrhage. Crace-Calvert[11] claims that nitrite of amyl is a most valuable drug in practically all cases of hemoptysis. He says the effect is due to the general low blood pressure

produced by the drug. Inhalation of 3 minims usually checks the bleeding almost at once. Hichens[12] advises in hemoptysis absolute rest in the sitting position, morphine, inhalations of turpentine and the assurance of the patient of a favorable outcome, followed by calcium chloride internally and a saline purgative. If the hemoptysis is persistent or recurrent he recommends nitroglycerin. Butler[13] states that certain forms of pulmonary tuberculosis react better to arsenic than to any other remedy. It is indicated in those cases with excessive expectoration and slow degenerative processes. It is counterindicated when the cough is harsh and paroxysmal with scanty expectoration and a tendency to hemorrhage. Myer[16] and Stolzenburd[14] report favorable results by the use of Bier's hyperemia in pulmonary tuberculosis, employed by means of a celluloid mass constructed after the fashion of an anesthetic inhaler which fits over the nose and mouth. Inspiration takes place through the nose, expiration from the mouth. It is worn two or three times a day for fifteen minutes, the length of the applications being gradually increased. So far no instance is known in which the mask has done harm. Hemoptysis is not a counterindication for its use,—in fact is less liable to recur by this treatment. It has also been proven to relieve pulmonary circulation in advanced cases of valvular disease of the heart and in obstinate asthma. Its advantages as pointed out by Kuhn,[15] its originator, are that it heals the tubercular foci in the lung and increases the red and white blood corpuscles and the hemaglobin in the blood.

*Pneumonia.*—Andreas[17] emphasizes the value of hygienic measures and plenty of fresh air in the treatment of pneumonia. Strychnine, whiskey and digitalis are recommended in suitable cases, and the application of cold compresses to the chest and the reduction of the temperature by cold sponging are favorably discussed. Patet[18] reports very favorably upon three cases of pneumonia in children treated with the open air method. Burt[19] recommends the injection of physiologic saline solution, care being observed not to use more than 1 dram of the solution to each pound of the body weight for each quarter of an hour. In conjunction with absolute rest, simple but nutritious diet, an unlimited supply of fresh air and sunshine besides ordinary symptomatic treatment are recommended. Smith[20] reports favorable results from personal experience with Galbraith's quinine and iron treatment of pneumonia. He gave from 40 to 70 grains of quinine, as called for by Galbraith, as an initial dose. Cree[21] concludes that in the symptomatic treatment of pneumonia calcium is a very valuable drug in the hemorrhagic type of cases but not in the dry type, in which class of cases he thinks it is more rational to prescribe citrate of sodium or potassium. In the type of cases in which heart failure is feared, unless there is a special call for calcium, he considers that there are drugs of more value. Edsall and Pemberton[22] report the history of five patients who were treated with Roentgen rays for unresolved pneumonia with most excellent results.

*Rheumatism.*—According to Sherman[23] the results thus far obtained in the serum treatment of acute articular rheumatism are materially shortening the course of the disease; no relapse into the chronic state;

decrease in heart complications; and a distinct tendency to complete recovery. He gives an initial dose of 20 cc. of the serum, followed by 10 cc. every day until the inflammatory condition subsides. In severe cases 20 cc. are given every day. An index of the tolerance of the serum is the amount of local inflammation produced by the serum from the previous injection. If this reaction is marked serum should be given by rectum.

*Typhoid.*—Bryant[24] treated 200 typhoid cases with guaiacol inunctions with only one death in the series. He says the temperature is controlled easier in most cases, patients feel better, skin is kept moist and very rarely does any diarrhea occur during this course of treatment. Gibney[25] insists on the use of the paquelin cautery in the treatment of typhoid spine as long as tenderness and pain on movement exists, and he says that it should be employed occasionally after these symptoms have disappeared.

*Tetanus.*—Noguchi[26] believes that the restricted germination and vegetation of tetanus bacilli, which takes place in eosin-treated animals, produce a small quantity of tetanus toxin which, acting locally on the tissues, gives rise in them to a degree of immunity. Specific experiments prove the presence of a degree of general immunity in such animals which in almost all cases is lower than the local immunity. Diffusion of antitoxin from this local area of high concentration into the sera of the low concentration, *i. e.,* the general body fluids, accounts for the general immunity produced. Sutter[27] reports three cases of a cure of tetanus after the development of convulsions, and collects twenty-two other cases from the literature. He used the serum locally to the wound and gave 100 units subcutaneously, repeated daily, and 20 units subdurally every other day. Hall, Carter and Howard[28] report a case of tetanus successfully treated with antitetanic serum.

*Cerebro-spinal meningitis.*—Flexner[29] reports the production of cerebro-spinal meningitis in monkeys by inoculation of the diplococcus intracellularis. He also reports a cure of this disease in this animal by the inoculation of serum derived from other infected monkeys. This serum served both as a preventive and a curative agent.

*Scarlet fever.*—Gordon[30] believes that in polyvalent antistreptococcic serum we have a remedy of great value in toxic cases of scarlet fever. It is essential, however, that adequate doses should be given, not under 50 cc., and that the serum should be fresh. He has not been able to obtain results with the ordinary antistreptococcic serum.

*Influenza.*—Broadbent[31] considers quinine the best remedy in influenza. He gives two grains every morning as a preventive agent during an epidemic. For a cure one dram of ammoniated quinine, 2 drams of liquor ammoniæ acetatis, every hour for three or four hours, is prescribed. The hydrobromate of quinine is given hypodermically for the fulminating attacks of influenza. McCourt[32] says that arsenic in alcoholic solution of 1 to 800, given in five minim doses morning and evening, is the most efficient prophylaxis against influenza. From 3 to 5 minims of tincture of fresh root of gelsemium, in 6 oz. of water, given in dram

doses, is considered a specific for this condition when no serious complications are present.

*Pertussis and croup.*—Sadger[33] reviews the history of hydrotherapy of membranous croup since 1821. He shows that many remarkable cures have been reported by various writers, commencing with Harder. The aim seems to be to induce powerful revulsion by sudden douches with cold water, and he urges a revival of this method. Kilmer[34] states that he is convinced, from three years' experience, that his abdominal belt for whooping-cough has been positively beneficial in 95 per cent of the cases.

*Plague and dysentery.*—Lucas[35] adds his testimony to that already given in support of the general great value of Haffkine's antiplague vaccine in reducing not only the incidence but also the mortality of this disease. In their communications regarding experiences in Russia, Skchivan and Stefansky[36] report successful treatment of dysentery by inoculation of horse serum from a horse immunized with filtrates of three weeks' cultures of Shiga bacillus. No by-effects were observed and the curative results were most gratifying.

*Respiratory diseases.*—Forchheimer[37] recommends in acute serous effusions cathartics, diuretics, diaphoretics, diet in the form of superalimentation, the reduction of fluid constituents, as recommended by Tufnells, Hay and Schrott. The latter consists in giving only stale rolls without any fluid. The milk cure has also been succesfully applied on the basis of its NaCl constituents. In chronic cases paracentesis according to Trousseau's[38] indications; first, when there are symptoms dangerous to life; second, without these symptoms with large effusions; and third, the lack of other methods to reduce the fluid. He agrees with Osler and Delafield that early tapping prevents sequelæ, such as deformities of the chest, bronchiectasis, chronic pneumonia, etc. He calls attention to Doerfler's theory that paracentesis causes an active hyperemia of the lungs and thereby tends to overcome the accompanying tuberculosis. In those cases which are not affected by repeated paracentesis, James and Lewaschew[39] recommended an injection into the pleura of an equal amount of 0.6 per cent NaCl solution. This is based upon the principle that diluted serum is more readily absorbed than undiluted. Forchheimer says the injection of iodine has been given up. West claims that incision and free drainage is rarely required, but James believes that should be tried when everything else fails. Regarding empyema, thoracotomy should be done in every case. Although some cases in children get well from aspiration, Bouveret has shown that the earlier the operation is done the shorter the duration. Resection of ribs and extensive resection of the chest walls is recommended by Eslander to finally cure an old pleuritic cavity. Schede, Fowler, Ransohoff[40] have reported good results from extensive resection of the ribs which have removed the adhesions covering the lungs and allowed it to expand. Frede[41] reports five cases with pleurisy treated with the withdrawal of 1 cc. of pleural effusion which is then reinjected subcutaneously at another point near the posterior axillary line on the opposite side. This was repeated three

times on successive days in acute cases, with excellent results. No other treatment was used and in every case recovery was rapid. In chronic cases 4 cc. or more was used. In tuberculous cases a reaction was present consisting of prostration and rise of temperature during the night following the injection. The author suggests that this reaction might serve to differentiate tubercular from other varieties of pleurisy. Chapin[42] reports a case of pleurisy with effusion cured by injecting intrapleurally 2 per cent formalin solution in glycerin. Other treatment employed previously had not prevented the reaccumulation of the fluid. For bronchiectasis Chaplin[43] concludes that it may be reasonable to suppose that if the patient be given sittings in a creosote chamber that the great danger of fetor would be obviated and thus the life of the patient greatly prolonged. Immelmann[44] reports a series of ten cases of asthma treated by Roentgen ray with remarkably good results. The asthmatic attacks were aborted and relief was almost immediate. He exposed the front, back and sides of the thorax in turn, a total exposure of ten minutes. Asthma due to cardiac or nervous factors is not amenable to this threatment.

*Cardio-vascular diseases.*—No new treatment has been given for acute heart failure, and Bolton,[45] writing on this subject, reviews the cause of the recurrence of such a failure and outlines the treatment which is usually adopted. Douglas, Barr and Bell[46] report the cure of a case of malignant endocarditis by inoculations prepared from the organisms in the patient's blood. Kolbeck[47] says that digitalis seldom if ever should be given in aortic regurgitation which has developed during or after middle life, or if there is evidence of myocardial degeneration. In young individuals, provided complete rest is obtained, digitalis is permissible, especially when there is combined mitral lesion. It should be discontinued before exercise is resumed. Neglect of this precaution might be followed by death from acute dilatation. It is counterindicated in aortic stenosis with cardiac insufficiency. Digitalis is indicated in mitral insufficiency, but in mitral stenosis it can be of no benefit in the absence of failure of the right ventricle. Hewlett[48] reports a case of heart block from the use of digitalis. Hayes[49] says that depression of tonicity exhibited by dilatation of the heart, hemic bruits and pulsation of the veins of the neck are all evidences for the use of the digitalis group of drugs. This indication holds irrespective of valvular lesions. He believes also that they should be given until either the result aimed at or the physiologic action is obtained. He combines digitalis with strophanthus and digitalis with squill and highly recommends morphine in all cardiac insufficiency, even those combined with kidney lesions. Rankin[50] recommends the combination of digitalis with nitroglycerin in aortic diseases. He says that the nitroglycerin prevents the high increase of peripheral resistance, and thus reduces the counterindication for the effect of digitalis in these cases, especially when compensation has failed. Starck[51] announces that the intravenous injection of strophanthin allows the drug to act almost exclusively on the heart, while the dose can be almost mathematically exact and the effect on the heart is always

amazingly prompt and powerful. He details seven cases in which it was used. No by-effects were ever noticed, although as much as 2.25 mg. were injected in one case in the course of three days. The average dose is 1 mg.; never more than 1.25 mg. The pulse changes almost at once after the injection. Approximately normal characteristics of the pulse, heart and lungs are produced. One patient was in such an advanced stage of pulmonary edema as to be almost moribund, but the injection of 1 mg. of strophanthin induced prompt relief, freeing the lungs and raising the output of the urine from 700 to 3000 cc. in 12 hours. In another case the urine increased from 300 to 3000 cc. in 12 hours. His experience seems to indicate that strophanthin is less toxic than has hitherto been supposed. Brunton[52] advocates the use of calcium salts when there is a tendency to cardiac failure. Calcium chloride, 5 to 10 gr., dissolved in water, every four hours, produced excellent results in cases of this condition in pneumonia. The salt in the form of lacto-phosphate, or glycero-phosphate, of calcium, was employed efficaciously in cardiac disease. Messalongo and Zambelli[53] give the particulars of three cases of severe cardiac defects carefully studied under the influence of dechloridization. Experience with these cases in the review of the literature have confirmed the facts they declare, that retention of sodium chloride is a constant phenomena of asystole in such cases during failing compensation, and is accompanied by edema. Restriction of the amount of salt ingested daily in the food may be sufficient to restore the balance and prevent incompetency of the heart. If this restriction is not sufficient, diuretics aand heart tonics will accelerate its effects. The heart tonic and diuretic alone may not be able to display their characteristic action. They gave their patient milk, unsalted bread and unsalted meat, supplemented, in preguancy, with diuretics. Milk alone contained too much salt and it also introduced too much fluid into the organism. Enriquez and Embard[54] report remarkable improvement of subjective symptoms in bradycardia after the institution of a free salt diet. Bennett[55] summarizes the action of Nauheim baths for the treatment of heart disease as follows: (1) A general dilatation of the capillaries and smaller blood vessels of the surface with consequent relief to the ventricular contractions; (2) a slowing of the pulse with more complete emptying of the ventricles; (3) an increase in the tone of the capillaries with probable increase in the force of the rythmical contraction causing additional volume in rate of the distal circulation; (4) a floating upward of the heavy abdominal viscera by hydrostatic pressure; (5) a reflex nervous effect on the cardiac ganglia, whereby the ventricular power is increased and regulated; (6) action of the skin and kidneys is increased; (7) certain beneficial trophic effects in cases of anemia, neurasthenia, osteoarthritis, diseases of the spinal cord, and in some cases of peripheral paralysis. Budinger[56] has written regarding the very excellent results obtained in the institutional treatment of both acute and chronic heart affections. He ascribes these results to the detailed and individual treatment given each case. Absolute rest and quiet, exact dietetic regulations, hygienic measures and regulated exercises, given strictly according to

indications to be met, are the most important factors to be considered. Wenckebach[57] reports a case of adhesive pericardium as a result of an exudative pleurisy in pericarditis in which operative interference produced most excellent results. Galli[58] comments on the importance of absolute abstinence from alcohol in all cardia-vascular affections. He says it is the one single greatest cause for progression of the conditions making cardio-vascular affections dangerous. Klotz[59] sums up his experiments on arterio-sclerosis as follows: The effect of high pressure drugs, adrenalin, digitalin and barium chloride on the arteries is a degenerative one, undergoing the changes beginning in the media and progressing to the other coats of the artery as previously described by other men. This effect is not abolished by nitroglycerin. Aneurysms are produced as a result of the destruction of the media. These experimental lesions are in every respect similar to the Moenckeberg type of arteriosclerosis.. Diphtheria toxins are similar to adrenalin in action on arteries. The changes produced by typhoid and streptococcus infections correspond to the arteriosclerosis described by Jores, with little destruction of tissue cells but a proliferation in the intima and inner layer of the media.

*Gastro-intestinal diseases.*—Solomon's[60] careful review of the action of the substitution digestive ferments, and many other combinations of digestents on the market, show pretty conclusively that they are all more or less valueless. He says that it is a rare condition to have deficency of the ferment in the entire gastro-intestinal tract, that the work of Pawlow and his school indicates that the composition of the digestive juices is modified according to the work which they have to perform and that this adaptive process is very little understood. Much more can be accomplished by the removal of the cause of any modification of secretion than by supplying a deficiency of that secretion, and that when any ferment is given the proper media should be supplied to allow it to be active. Muller's[61] conclusions from his research are to the effect that the best conditions for digestion of albumin occur when the albumin is dissolved in a low concentration aand the total bound acidity is low. Increasing amounts of free hydrochloric acid then promote the pepsin digestion to a certain favorable point, which remains constant. In case of high total acidity the same amounts of free hydrochloric acid have no influence on the pensin digestion, or possibly may hinder it. Faber's[62] treatment for achylia is that the food should be in such a form as to spare the stomach the task of further division. If intestinal disturbances are present, milk should be avoided. Buttermilk, or whipped cream, diluted with water, can sometimes be taken. Butter and eggs are helpful, but meat and raw fruits should be avoided, and vegetables should be mashed or strained. No dietetic restriction is necessary if there are no subjective symptoms. Pepsin and hydrochloric acid are indicated, but bitters are of more advantage, especially fluid extract of condurango before meals. There is little hope of actual cure, and the aim of the treatment is to keep the condition symptomless. Schmitt[63] recommends, among other points of importance in the treatment of ulcer, absolute rest

in bed, which relieves the stomach from traction, pressure, rests the greater curvature and lifts the anterior walls of the stomach out of the stomach contents. If there is any tendency to hemorrhage the patient must avoid all unnecessary movement, even in bed. He applies moist heat, or ice, locally. Diet should be nourishing, with the cautious addition of meat. In case of hemorrhage nothing is given by the mouth, but personally supervised rectal alimentation substituted. Food given by the mouth should be ice-cold milk, meat, jellies, etc. Little[64] says that with only a few exceptions the remedy for gastric ulcer is confinement to bed, diet and medication. His experience has not warranted him to recommend surgical intervention. Of twelve patients operated on by Eiselberg[65] for perforation of ulcer, five recovered. He extols jejunostomy after the perforation has been taken care of. It allows the stomach to be left in peace while the patient can be sufficiently nourished from the start. He says the remote results in his experience justify his conclusions that this operation is better than gastroenterostomy. Sutherland[66] reports two cases of hypertrophic stenosis of the pylorus treated successfully with gastric lavage and diet. A third case, in which it became necessary to stretch the pylorus, resulted fatally. Cheney[67] reports a typical case of hypertrophic stenosis of the pylorus in which a successful operation was done. Barbat[69] reports rather favorable results from numerous operations for ptosis of different abdominal organs. On the contrary Nyrop[68] reports very unfavorably upon the operation of gastropexy for fixation and replacement of the stomach for numerous varieties of gastroptosis. The symptoms were usually exaggerated and the anatomical conditions were very rarely relieved.

Kuttner[70] directs attention to the following points in the treatment of diarrhea. Opium is indicated when the diarrhea is due to the abuse of cathartics, but in dyspeptic or stercoral or parasitic diarrhea, purgatives and helminths are indicated. Nervous and reflex diarrhea demand attention to the underlying affections. Regulation of diet is very important except in nervous diarrhea, in which it does harm. General tonics are useful to improve the general condition of all forms. Schmidt's test diet is the best basis for an appropriate regulation of the diet. In cases of deficiency of gastric juice, hydrochloric acid should be given in large doses; in cases of gastric motor insufficiency with excessive secretion, lavage is recommended. If the cause is located in the large intestine, benefit will be derived from flushing the intestine. Evidence or suspicion of disturbance in the secretion of the pancreas indicates pancreatic extract. Drugs to arrest the diarrhea should be given very cautiously. The most important part is to diagnose the location and cause of the lesion and institution of rational treatment as thus indicated. Kohnstann[71] advises constipated patients to refrain from meat, acting upon the principle that there are some substances among the products of intestinal digestion of meat which have a direct inhibiting effect on peristalsis, or possibly act indirectly by checking the secretion of the intestinal walls and thus render the contents of the intestine dryer, which in turn renders them less susceptible to the peristaltic action of the intestine. Ito and

Asahara[72] report five cases of multiple tuberculous strictures with three cured from the operative treatment. Partial exclusion with lateral enteroanastomosis was done in three cases, giving a favorable result. One case with resection of 95 cm. of the small intestine succumbed to collapse. Reder has published a case operated on successfully by resection. Mann[73] reports nine cases of gastro-intestinal hemorrhage cured by the administration of a tablespoon of a mixture of 2 gm. citric acid, 20 gm. bitter orange peel, 20 gm. fluid gelatin. This has been used successfully in typhoid to prevent hemorrhage, as well as in ulcer and cancer of the stomach.

*Renal disease*—Marcus[74] tabulates the findings of metabolism in the patient with chronic nephritis during periods in which she drank ordinary water, and others in which she drank distilled water. During ten days in which she drank distilled water the output of urine was twice the amount voided during the corresponding period with ordinary or mineral water. The specific gravity of the urine dropped to nearly one-half, the total amount of albumin increased a trifle, while the blood became more condensed. The increased diuresis was not accompanied by increase in the amount of solid constituents in the urine. This speaks against von Noorden's conception of flushing out the system under copious diuresis. Peabody[75] emphasizes the importance of this treatment in case of general anasarca from parenchymatous nephritis with failing heart power, enhanced by the simultaneous administration of heart tonics. He says the value of colonic irrigation and catharsis is a negative one. After complete removal of the edema, he administers progressively increasing daily quantities of salt, carefully watching for any recurrence of the edema. He thereby endeavors to ascertain the exact salt equilibrium for each patient. Gruner[76] tabulates eight cases of dropsy in children showing the amount of salt in the fluids ingested and eliminated, the specific gravity of the urine, and other details of metabolism. They show the remarkable parallelism between the retention of salt and formation of edema, and a prompt subsidence of the latter under the influence of partial or complete deprivation of salt. Widal[77] says that dechloridization treatment enables us to combat certain formidable complications. It provides for the excretions from the organism of the chloride and water that clog the organism, and to draw up a regime in which the quantity of chloride ingested is proportionate to the permeability of the kidney for salt. French clinicians have made it a practice to use an exclusive milk diet for scarlet fever. It has been found that the same benefit is practically obtained by restricting the amount of salt in the food. Neither a milk diet nor dechloridization is able to prevent the renal affection, but it has a preventive action against, and also a direct curative action in, scarlatinal nephritis. De Vovis[79] reported cases of eclampsia treated successfully during coma by unilaterial decapsulation of the kidney, and adds five other cases from the literature which were treated successfully by this method. He thinks the high mortality rate of eclampsia justifies the procedure which, so far, has been very successful. Thorndyke[80] believes that in incipient tuberculosis of the

kidney hygiene and climate should have a chance before the kidney is removed. For the more numerous later cases, nephrectomy should be done in every instance.

*Blood diseases.*—Houghton[81] reports a case of pernicious anemia treated by lavage through a fecal fistula of the cecum, with irrigations of normal salt solution, of 1500 cc. peroxide of hydrogen, and sometimes permanganate of potash, washed in morning and night. Most of the time a goodly part of the fluid was left in. The diet was practically free nitrogenous matter and gelatin. Notwithstanding the amount of fluids received the stools remained solid. Claim of recovery is based upon the marked decrease of indican and aldehyde in the urine. Rosin[82] says that hot baths has a stimulating action on the bone marrow. In chlorosis he orders a hot bath of 104 F. about 11 A. M. for about 20 minutes, followed by a cold douche, rub down and rest for an hour. A cool wet cloth is kept on the head during the bath. Three of these are given each week for four to six weeks, at the end of which time he declares the improvement generally amounts to a complete cure. Steinberg,[83] regarding chlorosis as an infection of the ovaries and believing that hot mud baths have a very specific action on the ovaries, thinks they are indicated for this reason. He details a number of favorable effects as a confirmation for his assumption. Schubert[84] relates the cure of a very severe case of malana neonatorum by the subcutaneous injection of 10 cc. of a 2 per cent solution of gelatin daily. Mariagliano[85] calls attention to the prompt subsidence of the large glands at a distance from the part exposed to x-ray in a typical case of medullary leukemia. The spleen and the glands of the neck were exposed, which caused a decrease in all the glands and an improvement in the blood picture. He advises exposure over the neck, liver and spleen. He recommends the limitation of the non-penetrating rays, which have no curative action, while they are liable to affect the skin injuriously. This is accomplished by filtering the rays through diachylon of four layers, allowing more free use of the rays without injury to the skin. In Jacobson's[86] opinion quinine will check or postpone malarial paroxysms and the plasmodia will be driven out of the blood stream. On the withdrawal of quinine the plasmodia re-enters the blood; hence it is only palliative, not curative, and certainly not specific. He maintains that the withholding of quinine during acute malarial attacks will expedite ultimate cure because nature is given a chance to fight her enemy in the open, unsubject to the galling cross-fires of her own alleged allies. Rudis and Ford[87] produced an antimalarial serum by the successive inoculation of monkeys and goats with blood containing the plasmodium vivax. This antitoxin, when injected in adequate doses into malarial patients, was followed by the disappearance of the parasites from the circulation and the disappearance of symptoms of malaria. It had no apparent influence on infections caused by a variety of malarial parasites other than that from which it was developed. Mesnil, Nicolle and Aubert[88] do not state that any of the numerous animals were cured of trypanosomiasis with the various strains and preparations of arsenic. Ehrlich recently announced that this parasite required

an immunity to these drugs after a certain time, but that another chemical might be used against it with primal power, and thus that certain groups of chemicals might be found effectual when a single one would fail. Laveron van Campenhout and Kopke have also reported experiences showing the advantage of combining strychnine with arsenic in the treatment of sleeping sickness. Novy[89] reviews this literature very thoroughly but does not add any new points regarding its treatment other than that given by authors already mentioned.

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## DIAGNOSIS.

By Albert E. Taussig, M. D.

The most important diagnostic advances of the past year consist in the discovery of new aids for the detection of tuberculosis, especially the cutaneous reaction of Pirquet, the conjunctival reaction of Wolff-Eisner and the guinea-pig method of Bloch.

*Cutaneous Tuberculin Reaction.* Pirquet[1] was led to his discovery by a study of the changes occurring in ordinary vaccination. It is a mistake to suppose that after revaccination no reaction occurs at the site of scarification, an oversight due to the fact that ordinarily the patient is not examined again until after the expiration of a week. If such a case be carefully watched it will be seen that after the expiration of 12 to 24 hours a papule forms at the site of vaccination that soon disappears, leaving behind a small pigmented area. Nothing of the sort occurs, however, in cases of primary vaccination. Pirquet has shown that a similar reaction occurs in tuberculous individuals who are vaccinated with tuberculin. He places a few drops of Koch's old tuberculin, diluted four times, upon the skin of the arm at the usual site for vaccination. By means of a small rotary vaccinating lancet the skin is scarified at this point, thus permitting the entrance of the tuberculin. If the individual is or has been tuberculous a small papule appears within a day or two, at first bright red, then darker in color and vanishing in about a week. There is no general reaction and no pain. The reaction is probably an antibody phenomenon. It has long been known that the tuberculous process so affects the cells in its immediate vicinity, that when attacked by tuberculin they react with the production of a considerable quantity of antibodies. The latter attract leucocytes and lymphocytes so that the tissue is soon in a condition of small cell infiltration. Pirquet's observations indicate that this property is inherent not only in the cells adjoining the tuberculous process, but also in all the other tissues of the body, in particular the skin. Before publishing his results he had tested the method in about 500 cases. He found that nearly all tuberculous children reacted positively, the exceptions being cases of miliary tuberculosis, tuberculous meningitis in the terminal stage and extreme cachexia, conditions in which tuberculin injections too give untrustworthy results. In adults the method is less valuable, decreasing in significance with the age of the patient, because more and more apparently non-tuberculous individuals give the reaction, until after a certain age nearly every one reacts. His explanation is that city dwellers nearly all undergo an infection with tuberculosis at some time in their lives and that the reaction occurs not only in active and in latent tuberculosis but even in perfectly healed cases. In his original communication, Pirquet expressed himself with some reserve as regards the reliability of the test, but at the recent Tuberculosis Conference, in Vienna, he declared the reaction an

infallible indication of the existence of an active or healed tuberculous process.

The method has been extensively tested, especially in the large clinics of Germany, France and Italy, with somewhat contradictory results. In a series of 48 nursing infants so tested, Engel and Bauer[2] obtained a positive reaction 6 times. Five of these 6 infants were almost certainly not tuberculous; one of them came to autopsy and the other 4 failed to respond to tuberculin injections. On the other hand in a series of 208 older children very satisfactory results were obtained. They conclude that the method is applicable to older children but not to very young infants. Bandler and Kreibich[3] used the test upon dermatologic material. It was positive in all tuberculous skin affections except where there was extreme cachexia, but was also positive in a considerable proportion of non-tuberculous cases. Similar results were obtained by most other observers in all varieties of tuberculosis. Among the striking exceptions are Olmer and Terras,[4] who obtained a positive reaction in only 20 out of 31 adult tuberculous individuals. While the final decision as to the value of the test must be left to the future, the following conclusions seem fairly well justified: Pirquet's test is a trustworthy indication of the presence or absence of tuberculosis in children more than two years old; in adults, a negative test speaks strongly against the presence of tuberculosis, a positive reaction having much less diagnostic value.

*Conjunctival Tuberculin Reaction.* During the discussion following Pirquet's demonstration of his method in the Berlin Medical Society, Wolff-Eisner[5] announced a modification of the test consisting in the instillation of one drop of a ten per cent solution of tuberculin into the conjunctival sac. In case of tuberculosis, a more or less severe conjunctivitis, rarely accompanied by a very mild general reaction, was said to result. About a month later Calmette[6] reported the results of independent work along the same lines. In order to avoid the irritating effect of the glycerine present in tuberculin upon the conjuctiva, he precipitates the active principles of tuberculin with 95 per cent alcohol and redissolves the precipitate in 100 parts of sterile water. One drop of this solution is instilled into one eye of the person to be tested. Within from three to five hours the individual, if tuberculous, will have a marked congestion of the palpebral conjunctiva, which becomes red and edematous. The lacrymal caruncle is also swollen, red, and covered with a slight fibrinous exudate. The inflammatory reaction continues, and at the end of about six hours the fibrinous secretion has increased so as to form a number of threads in the conjunctival cul-de-sac and at the internal canthus of the eye. The reaction reaches its maximum in from six to ten hours. There is no pain, but the patients complain of a slight burning and of a blurring of vision due to the abundant exudate. All signs of the reaction have disappeared by the end of eighteen to twenty-four hours. In the non-tuberculous there is no reaction whatever, or at most a slight redness, which rapidly disappears, and is unaccompanied by lacrymation or a fibrinous exudate.

It soon appeared that a 10 per cent solution of tuberculin as suggested by Wolff-Eisner was often productive of an excessive local reaction, and later observers have nearly uniformly used a one per cent solution, either glycerine-free, following Calmette, or a mere dilution of ordinary tuberculin. The latter seems to suffice since the congestion, occasionally produced by the trace of glycerine, disappears before the real reaction sets in. In France, Comby, Latulle, Petit and others obtained confirmatory results. Citron found a positive reaction indicative of tuberculosis though he occasionally failed to get it in advanced or cachectic cases. His description differs from that of Calmette in that he found the reaction at its height 12 to 24 hours after instillation, the last trace of conjunctivitis disappearing after 2 to 4 days. Schenck and Seiffert[7] report similar observations. Still more recently Baldwin,[8] at Saranac, obtained good results with this method. Our own experience with the method indicates that a one per cent solution of old tuberculin is unirritating to the normal eye, that the reaction is specific for tuberculosis, but that some caution must be exercised in the selection of the tuberculin, the product of one of our domestic manufacturers having proven inert. On the whole and in spite of some unfavorable reports it seems probable that the conjunctival method has some points of superiority over the cutaneous inoculation. It is applicable to adults and a positive reaction speaks strongly in favor of the presence of tuberculosis, a negative reaction having less significance. Its simplicity, painlessness and harmlessness serve further to commend it to the general practitioner. A final opinion as to its value cannot yet be given.

*Conjunctival Typhoid Reaction.* Working along the same line, Chantemesse,[9] at the recent session of the International Congress for Hygiene and Demography, stated that he had successfully applied a similar method to the early diagnosis of typhoid fever. He uses an aqueous extract of the pulverized and sterilized typhoid bacilli, thus obtaining their endotoxin. A small amount, a half or a third of a milligram, of the toxin is instilled into the lower conjunctival sack. The typho-toxin being a local irritant, the instillation is often followed by some burning, lachrymation and injection, which, however, in a non-typhoid patient disappears within 5 or 6 hours. In typhoid fever, however, the conjunctivitis reaches its height in 12 to 24 hours and persists several days. In 50 non-typhoid patients the reaction was positive only once, in a woman who had had typhoid fever two years before. In 66 typhoid patients the reaction was positive in all, occasionally, indeed, several days before a positive Widal test could be obtained. The conjunctivitis produces very little subjective discomfort and never any unfavorable complications. The method has not yet been generally tested owing to the difficulty of obtaining a proper toxin. Kraus, Luxenberger and Russ,[10] of Vienna, have obtained results that lead them to pronounce against the utility of Chantemesse's method. Further work along these lines is required in order definitely to establish the value of these reactions for diagnosis. It is to be hoped that it will be found possible

to utilize them in other infectious diseases, especially in acute cerebro-spinal meningitis, in which early diagnosis is so important.

*Other Diagnostic Methods in Tuberculosis.* In the sputum it is usually possible to recognize tubercle baccili by means of their staining reaction, although even here cases have been reported in which the presence of other acid-fast bacilli has led to false diagnoses. In the urine, however, these other bacilli, especially the smegma bacillus, are so common that it is hardly ever possible to be absolutely certain that the stained sediment actually contains tubercle bacilli. Rolly[11] has recently shown quite conclusively, that only by means of the inoculation of animals, especially guinea-pigs, can we positively demonstrate the presence or absence of tubercle bacilli in the urine. This method has, however, hitherto been very tedious. It has usually been necessary to wait two or three months until the animals died of disseminated tuberculosis for fear that, if they were prematurely killed, a slight tuberculous infection might be overlooked. A method recently devised by Bloch[12] has, however, done away with this unpleasant feature. The sediment is injected into the animal's groin. The inguinal glands, palpable as tiny kernels, are then picked up in a fold of the skin and crushed between the fingers. If the injected sediment contains tubercle bacilli, the inguinal glands will within 8 or 9 days have attained the size of a hazel nut and a spread from their cut surface will contain multitudes of tubercle bacilli. Smegma and other acid-fast bacilli apparently do not proliferate in the crushed glands. Joannovics and Kapsammer[13] have subjected this method to a rigid test. They used emulsions of various strengths of tubercle bacilli cultures and examined the glands 10 days after injection. When the emulsion averaged as many as one bacillus in 48 fields of the microscope, the glands were found macroscopicaly enlarged and full of tubercle bacilli. Higher dilutions failed to produce perceptible glandular enlargement, but even emulsions containing only one bacillus in 384 fields, the highest dilution tested by them and one in which it would be practically impossible to find the bacilli in a stained spread, produced typical microscopic alterations in the glands and the bacilli were sufficiently numerous to be readily found. Bloch's method thus represents a valuable aid to the diagnosis of urogenital tuberculosis, and it is to be hoped that it will be found applicable to sputum and other tuberculous material. Primary tuberculosis of the guinea-pig can be excluded by a preliminary injection of half a cubic centimeter of tuberculin, which kills tuberculous guinea-pigs without affecting healthy ones. Joannovics and Kapsammer however state that in all their experience, extending over many years, they have never found a guinea-pig affected with primary tuberculosis.

In 1906 Mueller and Jochman described a method of distinguishing between tuberculous and other pus. Small drops of the pus are placed upon Loeffler's culture medium, consisting of beef or sheep's blood-serum to which a little glucose-bouillon has been added and incubated at a temperature of 50°-55° centigrade. Ordinary pus rapidly digests the serum, forming a little depression, whereas tuberculous pus produces

no effect. This is apparently due to the fact that ordinary pus contains polymorphonuclear leucocytes which upon disintegrating set free a ferment that digests the culture medium. Pure tuberculous pus contains no such cells. Kolaczek and Mueller[14] have tested this method in a large number of cases and come to the following conclusions:

1. Pus that fails absolutely to digest Loeffler's serum is certainly tuberculous; if the digestion is very slight it is probably tuberculous.

2. A rapid, extensive digestion of the serum speaks for an acute infectious suppuration, but a tuberculous process cannot be excluded if there is a possibility of a mixed infection or if the tuberculous tissue has been treated with iodoform.

Unfortunately this method cannot be readily utilized by the practitioner, since it requires plates of a special culture-medium (for which, however, the ordinary diphtheria culture-tubes may be substituted) and an incubator set at an unusual temperature. Mueller,[15] however, has substituted a very much more convenient though possibly somewhat less accurate method. A shallow porcelain dish is filled to the brim with Millon's reagent and a drop of the pus is allowed to drop into it. Tuberculous pus solidifies instantly, forms a little skin on the surface of the liquid, and on being immersed contracts into a solid lump without staining the fluid. Ordinary pus, on the other hand, rapidly disintegrates and colors the reagent bright red. The rationale of the test is similar to that of his predecessor. The ordinary pus digests itself with the production of albumoses and similar substances that are soluble in Millon's reagent and give it the color characteristic of aromatic groups. Tuberculous pus is free from such ferments but contains more coagulable albumen. If further work shows the test to be trustworthy it will be a valuable means of determining readily the nature of empyemas, broken-down glands and the like. Doubtless the same restrictions apply to it as to the original Mueller-Jochmann method.

Koch's original method of injecting tuberculin was to begin with one milligram and gradually to increase the dose to ten. Whether or not these doses are unnecessarily large and productive of needlessly severe reactions is still under discussion. In 1905, at the Tuberculosis Congress in Paris, Lowenstein and Kauffmann maintained that a dose of one-fifth of a milligram repeated several times at intervals of a few days sufficed for all diagnostic purposes. The relative value of the different doses has been tested by Roepke[16] on over 700 patients. He came to the conclusion that the dose advocated by Lowenstein was much too small, as it entirely failed to produce reactions in most of the patients with early lung signs upon whom it was tested. He believes, however, that Koch's doses were too large and advocates giving one-fifth, one and five milligrams at intervals of a few days, if no reaction is produced. This gives results as good as with Koch's method with only half the maximum dose. Lowenstein,[17] however, still maintains his position, holding that the dose of one-fifth of a milligram need never be exceeded and that it is only necessary to repeat it four times within

twelve days in order to obtain a reaction in all tuberculous patients. Junker[18] occupies an intermediate position. He uses progressive doses of one-tenth, one-half, one and five milligrams, but states that the great bulk of tuberculous patients respond to the smaller doses. Nearly all recent cases react to the smallest dose. He considers an elevation of 0.8° C. (1.5° F.) in temperature sufficient for a positive reaction. The writer's own experience, while not based on so large a material as that of these clinicians, leads him to prefer Koch's original dosage. At all events the question is as yet not definitely settled.

*A Rapid Stain for the Spirochaete of Syphilis.* While of great scientific interest, the difficulties attendant upon the staining of the spirochæte pallida have interfered with its routine utilization for diagnostic purposes. Giemsa[19] has modified his technic so that it is now possible to stain spreads of the bloody serum from primary or secondary syphilitic lesions in two minutes. The lesion is scraped with a knife and the exuding serum spread in an even, very thin layer on an object glass. No fixation is necessary unless the material is very fresh, when it should be passed three times through a gas or alcohol flame. It is then stained with a fresh preparation of the Giemsa stain (10 drops in 10 c.c. of distilled water). The fluid is poured over the material and the object glass is held 5 cm. above a flame until it just begins to steam. It is then removed for fifteen seconds. The stain is then poured off and fresh stain is poured over the moist preparation, which is heated again, and again removed from the flame for fifteen seconds. This procedure is repeated four times, leaving the stain in contact with the preparation for a whole minute the last time. It is then rinsed, when it is ready to examine. He adds a number of minor points which enhance the effect, among them the necessity for preparing the stain only just before it is to be used, and refraining from shaking and from the slightest admixture of any acid in the water or clinging to the dishes used.

*Tests for Occult Blood in Stomach Contents, Stool and Urine.* Schroeder[20] has found that the guaiac test for invisible blood is most delicate if the amount of blood present bears a definite relation to the amount of guaiac used. An excess either of blood or of guaiac impairs the delicacy of the reaction. He makes three dilutions of the guaiac. Into the first test-tube he puts 5 or 6 drops of a 20 per cent tincture of guaiac (freshly prepared) and one cubic centimeter of absolute alcohol; into the second, the same amount of alcohol and one drop of the guaiac tincture; into the third, the same quantity of alcohol and a few drops from the first test-tube. Equal parts of turpentine are then poured into each tube, and finally one cubic centimeter of the etherial extract of the substance to be tested. In this manner one of the tubes will represent the most favorable possible conditions for a blood test.

Einhorn[21] has modified the benzidin test for occult blood in an ingenious manner. Filter paper is soaked in an alcoholic extract of benzidin and dried. The paper so prepared is immersed in the etherial extract to be tested and a few drops of peroxide of hydrogen added. If blood is present, the blue color appears promptly.

Holland[22] suggests replacing the turpentine or peroxide of hydrogen used in the blood tests by sodium perborate prepared by Schering from sodium dioxide and boric acid. It is perfectly stable and may be had in tablet form. A tablet immersed in water immediately produces a fresh solution of peroxide of hydrogen. The perborate may also conveniently be used as an oxidizing agent in performing the test for indican.

*Appendicitis.* The subject of the early diagnosis of appendicitis is of perennial interest. Blumberg[23] has made an interesting observation in this connection that may prove of diagnostic value. In the typical case of early appendicitis gentle pressure over the affected area produces pain, which ceases as soon as the pressure is relaxed. When, however, instead of being gradually withdrawn, the hand that exerts the pressure is suddenly removed, the resilient tissues are thrown into more or less vibration, and this in itself may produce a pain which the patient can nearly always clearly distinguish from the original pressure-pain. He believes that this pain, produced by the sudden withdrawal of the palpating hand, is dependent upon the inflammatory involvement of the peritoneum. If it is more intense than the pain produced by the palpation of the appendix, the infection is probably progressing; if less intense the disease is retrogressing. The worst cases are those in which the symptom appears suddenly and with great intensity. Soon after the appearance of Blumberg's article, Ewald[24] was able to confirm the value of the procedure and Tretzel[25] reported that he had found it very useful. He found it positive in all active cases of appendicitis and also in diseases of the adnexa with peritoneal involvement and in certain cases of gastric ulcer. On the other hand it was absent in all non-peritoneal abdominal affections, and was of no value in advanced cases of appendicitis with exudate or after perforation. In the latter group of cases the procedure may not even be quite free from danger.

Rovsung[26] suggests still another mode of palpation in appendicitis. He found that when he made pressure over a corresponding region on the left side of the abdomen, the patient complained of pain over McBurney's point if appendicitis was present, but not in other abdominal affections. His attention was attracted to this by two patients who entered his service the same day with the diagnosis of acute appendicitis. In each the right iliac fossa was so sensitive that he did not venture to test McBurney's point for fear of doing further injury, and the idea came to him to test the corresponding point on the left side. In one patient this elicited intense pain at McBurney's point, the intense pain occurring with lightning rapidity at this point when compression was applied to the middle of the descending colon. In the second patient, although the right side was so sensitive, compression of the left side did not elicit any pain at McBurney's point, even when vigorous pressure and massage were applied to the descending colon. The operation showed the first case to be appendicitis while in the second the appendix and its vicinity were entirely sound, the trouble being a retroperitoneal effusion and perirenal phlegmon. Testing this indirect means of eliciting

the pain at McBurney's point on more than 100 patients during the past two years has confirmed its differential value.

*Ileus.* Ewald[27] calls attention to the importance of early and repeated gastric lavage in all cases of suspected intestinal obstruction, as well for diagnostic as for therapeutic reasons. At a time when the symptom-complex of intestinal obstruction has not yet become well defined, in particular long before feculent eructations or fecal vomiting occur, the stomach contents obtained by means of lavage have a fecal odor. Such stomach contents indeed can be obtained at a time when the existence of ileus can hardly be more than suspected. The procedure, he states, not only permits early operation, but repeated lavage so improves the patient's condition as to make him come to operation in better shape. He fails, however, to take into consideration, as an occasional source of error, the fecal regurgitation of hysteria.

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# NEUROLOGY AND PSYCHIATRY.

By Sidney I. Schwab, M. D.

On account of the restricted space allowed in the review this year, no attempt will be made to give even a partially thorough consideration of the literature of neurology and psychiatry as it may be measured by the papers that have appeared. An effort will be made, however, to indicate some of the newer lines of thought which have led neurologists to follow, if not untrodden, at least the older paths of investigation, with a truer realization of the nature of the problems and methods of arriving at a more satisfactory result. A study of the literature of the year allows of at least one very definite conclusion and that is, that a more than usual intelligent effort has been spent in the study of the functional diseases of the nervous system; above all to the study of hysteria and its allied neuroses. The impulse in this direction noted in the reviews of the past is largely a result of the barrenness in the field of the strictly anatomical side of nervous diseases.

The problems presented by the morbid anatomy of various types of nervous diseases had received their just appreciation from scores of workers in the years that have passed, and they have made the necessary deductions from the end results of diseases, so that the type presented clinically has been brought in relation with the post-mortem appearances in a large number of diseases. This work has been done with a thoroughness and a care that has probably never been equaled in a similar line of investigation, and it may be said now, with a certain amount of conviction, that the neuropathologist awaits the improvement in technique and in the knowledge of the physiology and anatomy of the nervous system which will make further progress a definite possibility. There is given in this way an opportunity for the study of the functional diseases which has attracted some of the best minds. In consequence, we have before us a stimulating series of papers dealing with the study of the genesis and the development of hysteria, neurasthenia and other neuroses, which open for further study a host of attractive possibilities. The meetings of the French and, to a greater extent, the German Neurological Societies have been taken up with the discussion of hysteria from the point of view of the later theories. The aim of this kind of work is to disentangle the subject of hysteria from a purely symptomatic conception, that is presenting certain types to that of a definite morbid condition whose laws of development and origin can be understood. It was formerly the main effort of writers on this subject to fix, in as many ways as possible the lines which made the diagnosis of hysteria certain when compared to organic diseases. It is now the effort of investigators to establish hysteria on a firm basis, which shall include the various symptoms, not from the point of view of their differentiation from other symptoms, but as they originate from a morbid mental state. This physiopsychological tendency may be said to be the most significant as-

pect of the work on this subject that has appeared during the year. The publication of Janet's lectures on hysteria, which were delivered before the students of Harvard University, and the various papers which the discussion of his point of view has inspired, may be regarded as presenting this tendency in the most striking way. As opposed to this view may be mentioned Babinski's insistence that hysteria is merely a collection of symptoms which persuasion can remove and which suggestion causes. Freud's reiteration of the etiologic factors concerned in its production brings out the varied phases of the whole subject in such a way that there is place for all sorts of investigations from this triple standpoint. Janet's lectures and the papers belonging to that conception make an illuminating phase in the study of hysteria and its morbid phenomena. Mention must likewise be made of the work of an American student of the subject, Prince, who has developed further than has anyone else, perhaps, the point of view of the value of the dissociation element in the causation of hysteria and likewise of neurasthenia, and the name of dissociation neurosis is one met with in many places. One conception of this view deserves mention from its novel suggestiveness. Prince holds that in certain cases of hysteria the neurasthenic symptoms, or perhaps neurasthenia, may be viewed as a symptom of hysteria. Whatever the faults of this idea may be, the point of view is worth considering, especially in that common class of patients in whom the two diseases are met with together. No one hesitates to admit that this is often the case. It must not be lost sight of that Dercum many years ago advanced he idea, whether original or not with him, that neurasthenia is strictly a fatigue neurosis, and that all the important symptoms presented by this disease may be interpreted from this point of view; especially the various parasthesias and painful subjective sensations. These wrongly interpret normal sensations which, in fatigue states, transcend the limits of normal painful experiences, giving a clue to understanding much that has been scarcely appreciated in this disease. With this broader conception of the neuroses, presented very inadequately by these few remarks, there seems no doubt that in the next few years the more intelligent physicians, who deal largely with this class of diseases, will find much that will illuminate the subject. There is no better way to illustrate what is being done in this field than to quote Janet's definition of hysteria, given in his lectures. It may be stated by way of explanation that Janet himself deprecates the attempt to define any subject, the whole of which is not better understood than is hysteria. For him, hysteria may be regarded as a form of mental depression characterized by the retraction of the field of personal consciousness and a tendency to the dissociation and emancipation of the system of ideas and functions constituting personality.

In the field of organic diseases perhaps no work deserves more attention than the effort on the part of Robertson and his associates to further develop the idea that dementia paralytica and tabes are caused by a specific organism, the discovery of which might lead to the possibility of a curative serum. Towards the accomplishment of this end these in-

vestigators have used every means which scientific research affords, and have brought to bear all technical methods at their command. As a result, a protective serum has been found which, in animal experiments at any rate, has seemed to accomplish something. In their trials upon individuals suffering from dementia paralytica or tabes, the effect of the serum has been more problematical. There has been some improvement, it is true, but it seems questionable whether the improvement can be laid to the effect of the serum, at least in a specific sense. The antiserum is prepared from the particular diphtheroid bacillus present in each case. This is interestingly shown in a case of tabes dorsalis where the improvement in the usual symptoms of the disease was very marked. Whatever may be said of the work itself, nothing but praise can be said of its quality. Each publication by the authors shows an increasing amount of important data on the bacterial side of this disease. The question to decide is whether the organisms present, and upon which most of the work has been done, is really a specific organism for this disease; the authors, with all their work, have not satisfactorily answered this question.

It is instructive to note the growing tendency of investigators to plan an extensive piece of research and follow it out until some definite conclusion is reached. In this way we have to indicate from year to year the progress of such a line of inquiry. A good example of such work is the continuation of Row's and Orr's study of the importance of the lymph circulation in the diseases of the spinal cord. This throws much light on the mechanics, if it might be so called, of toxic substances acting on the central nervous system. The conclusion of their early studies was that the starting point of degeneration of early tabes and dementia paralytica was in the intramedullar position of the sensory fibres as soon as the neurilemma sheath disappeared. This point was noted in a former review of their work. In the study mentioned here, they have supported their first contentions by a great variety of experimental observations and deductions from post-mortem findings. Some of their conclusions are strikingly interesting. For example, they believe that in the peripheral and cranial nerves there is a constant stream of lymph ascending towards the central nervous system whose main current lies in the inner meshes of the lymph spaces of the fibrous perineural sheaths. Toxins reach the brain and cord by this channel. In their extramedullary portion, these nerves are protected from the influence of the toxins by the vital action of the neurilemma sheath, but on losing this in their intramedullary part, they at once undergo degeneration. The first change is a primary degeneration of the myelin. The axis cylinders and nerve cells are evidently affected later. Something of the same kind of problem is taken up by Buzzard in the Gulstonian lectures before the College of Physicians in London. He has given to his work the rather vague term, "On Certain Acute Infective or Toxic Conditions of the Nervous System." Under this he includes all cases of acute paralysis. The motor paralysis must present good grounds for the belief that it is of infective or toxic origin. The following are to be considered typical of

this class of diseases: Acute anterior poliomyelitis, Landry's paralysis, acute toxic polyneuritis, acute ascending or diffuse disseminated myelitis. His conclusion is of interest. He shows evidence that there are four different kinds of acute paralysis; that there are clinical and anatomical points by which they may be differentiated, and finally, but by no means conclusively, that acute poliomyelitis is an acute specific fever in which the nervous system is attacked through the circulation; acute ascending myelitis, a spinal lymphangitis; Landry's paralysis, a species of spinal lymphatic intoxication, and toxic polyneuritis, a toxemia producing a parenchymatous degeneration of the lower motor neurones.

The publication of the third volume of the Archives of Neurology from the pathological laboratory of the London County Asylums will bring forward again the excellent work done there under the direction of Mott. Besides a number of papers by the director, there are a number of notable examples of clinico-laboratory investigations of the most advanced character. It is to this side of the question which the work done in the laboratories at Clayburg chiefly relates. The clinicopathological method of investigation receives here its best example. There is one paper among the collection which is selected for mention, not alone on account of its excellence, but, likewise, because it is in line with some of the most important work which has appeared during the year. It is significant that syphilis of the nervous system has received more than usual attention, not alone from its clinical aspect but from the diagnostic view. The discovery of a special specific reaction in the cerebrospinal fluid of syphilitics will be referred to later. The paper quoted in this connection is by Mott and touches upon the changes found in the nervous system in cases of tryphanosome infections. Of special importance are the relations of such lesions to syphilitic lesions of the nervous system. Inasmuch as syphilis is pretty well believed now to be the result of a trypanosome infection, and sleeping sickness and dourine are due to the same character of organism, a comparison of the lesions found in the two diseases ought to be instructive. This paper is an absolutely unique one, in that no such study of the nervous tissue in such diseases has ever before been attempted.

To illustrate the wealth of material used in this investigation, it need only be mentioned that twenty-five cases of individuals dying from this disease, and the tissues of monkeys inoculated with blood from spinal fluid of patients dying of this disease, were used. The similarities in the tissue changes of syphilis and those of sleeping sickness are sufficient to indicate, at least, that there is no obstacle in the way of believing the hypothesis that both are due to the invasion of an organism of the trypanosome class.

The most important piece of work from the standpoint of etiology and, to a less extent, of diagnosis, is that which has been directed toward the discovery of some specific reaction or substance in the blood or spinal fluid by which existence of previous syphilitic infection might be ascertained with some degree of certainty. The importance of such a discovery need not be dwelt upon here. It must be patent to everyone

that if it were possible in any case of tabes or dementia paralytica to say with exactness that a previous syphilis had existed, the question of the specific origin of these two diseases would be largely solved. The dependence upon the statistical method for the proof, or the reverse, of the syphilis theory of tabes and dementia paralytica has led to endless dispute. The discovery of the specific reaction and the presence of specific antibodies in the spinal fluid of patients with syphilis is largely due to the researches of Wasserman and his pupils. A number of preliminary papers have appeared testing the correctness of his assumptions in cases of dementia paralytica and tabes. Plaut, Morgenroth, Stertz, to mention only a few, have found a striking percentage of the occurrence of the specific reaction and the presence of the two diseases. In the examination of the spinal fluid in individuals who did not have these diseases, and in whom there was no special reason for suspecting a previous syphilis infection, the reaction was not found. In Stertz's paper, for example, all of the eight cases of dementia paralytica examined show the reaction positively. Of course, it is too early to determine with exactness either the correctness of Wasserman's theory or its relation to syphilitic diseases of the nervous system. It is necessary that a larger statistical material be at hand. It seems very likely, however, that we have now a method that will eventually determine the burning question of the relation of syphilis to tabes and dementia paralytica, and likewise have at our hands a ready method of deciding in doubtful cases whether the group of symptoms present are due to syphilis. The importance of the latter aspect of the case can not well be exaggerated, because there is no doubt that at present there is much error on both sides, useless antisyphilitic treatment and its neglect in suitable and perhaps favorable cases.

There has been an unusual activity shown in the study of epilepsy in the past year. Some of this work seems highly significant, not so much as promising an early solution of the complicated problem presented by the diseases, but rather suggesting that further study will no doubt always bring something that will increase the aggregate of our positive knowledge. It must be remembered that epilepsy presents to the pathologist, as well as the clinician, an unusually favorable field for study. In the first place it is probably the most common organic disease of the nervous system. It can be produced experimentally on animals, its postmortem material is unusually plentiful, and lastly, it is a favorable territory for surgical intervention. So that from every point of view we see this disease in large numbers. There are at least three ways of looking at it from the pathologic point of view. We may assume that there is specific pathologic change as a result of the disease, we may assume that there is an abnormal state of the blood vessels or in the circulatory mechanism in the brain, or we may believe that there is contained in the circulating blood some substance which, when brought in contact with the anatomical elements of the brain, causes the symptoms now known as epileptic. Each of these points of view may be illustrated by papers appearing during the year. Ceni, who was the first investigator who did serious work on the toxic blood theory, claimed to have dis-

covered a specific immunity reaction in the blood of epileptics, by which an individual suffering from the attacks could, so to speak, immunize himself with his own serum. He still holds that view. He says that animals immunized with epileptic blood serum that is hypotoxic for man suffer no inconvenience. Animals who are submitted to a process of immunization with the epileptic blood serum that is hypotoxic for man die rapidly. The intoxication, however, presents nothing that is common with the phenomenon of epilepsy. It can be said of this work that it has not received the agreement of other workers in the same field. However promising the outlook might seem theoretically, there does not appear to be any likelihood that epilepsy is purely a bacterial or toxic disease in the sense used in Ceni's investigations. Sala now considers epilepsy strictly from the pathologic point of view, that is the point of view that is concerned with specific tissue changes. He examined the brains of ten epileptics with the greatest care and with all the newer technical methods. He gave especial attention to the findings in the cortex and in the ammons horn. A number of definite changes were found chiefly in the matter of neurologial hypertrophy. He concludes, however, that none of the changes found is at all characteristic or specific of epilepsy, but may be found in many other morbid conditions and even in simple senility. It is probable that they are all produced secondarily to the circulatory disturbances mechanically produced by the attacks. In cases of epileptic idiocy, however, no doubt some of the changes, particularily the glia overgrowth, may be ascribed to defect in development.

Turner, whose work on the causation of epilepsy deserves close study, contributes two articles which are of very great interest. He holds the theory that epilepsy is caused, or rather is a disease occurring in persons with a defect in the nervous system, either congenital or involutional, and in whom also there is an abnormal state of the blood, characterized by a special tendency to intravascular clotting, and that the fits, whether of grand or petit mal, owe their exciting cause to sudden stasis of the blood stream in some (generally limited) portion of the cortex, resulting from the blocking of cerebral-cortical vessels by these clots. Forty-one cases of epilepsy were examined microscopically, and the thesis was defended on the score of the findings in this large material. Now, a further step in the proof of this theory naturally is that the blood of epileptics be examined while alive, to determine whether there existed anything so abnormal as this. In a paper entitled "The Coagulation Rate of the Blood in Epileptics," Turner further attempts to strengthen his position. Nine epileptics were carefully studied with the idea of determining the coagulation rate, the blood pressure variations, and other data in the circulating apparatus. It was shown that the observations confirmed the previous ones, and demonstrated that, as compared with persons in good health, the blood of epileptics coagulates in a shorter time, and also that this is more marked just before or during the fits than when the patient is free from them. Against the criticism that this might have been caused by the fits themselves, there is a series of observations taken some time before the fits. From many points of view, this is an important observation.

It establishes a certain set of facts which simply wait for further confirmation to justify some attempt to use therapeutically some of the data. To attack the therapeutic problem of epilepsy from the point of view of coagullability of the blood would certainly arouse more enthusiasm than the therapeutics of this disease seem to offer on more classic and usual lines.

Some notice must be taken in this review of the question that has been agitating the neurologic mind since the paper of Marie on the subject of aphasia appeared. This paper had for its object the demonstration that Broca's aphasia, the so-called motor aphasia, had absolutely no right of existence, and that the divisions of aphasia into the sensory and motor types was not borne out by the facts. As is well known, the original theory advanced by Broca was based upon two autopsies, neither of which today would be accepted as definite proof of the theory advanced by him, and as is known was not altogether believed even by himself. A number of papers have appeared on the subject. It is difficult to select any that can be taken as typical of the points in dispute. Marie himself contributes several papers, in one of which he relates the history of Broca's discovery and the origin of the theory attributed to him. Dercum, in a paper entitled "Marie's Views on Aphasia," refers to fourteen cases of aphasia which he examined to test Marie's conclusions. He finds that in all these cases there is evidence of the mental defect so prominent a sign in the cases cited by Marie. He concludes that in the main Marie's criticism of the Broca theory is tenable, and says further that there is much doubt concerning the specific activity of the third frontal convolution, the so-called Broca center. Dejerine, on the other hand, brings evidence in support of the old contention. He describes two cases of motor aphasia, in which the lesion is sharply confined in the anterior part of the speech center, that is, Broca's area, without implication of the operculum, the motor convolutions, the temporal lobes, or the basal nuclei. It can be readily seen that the question is still very undecided. There seems to be no doubt, however, that Marie's position is taken deservedly and that his observations will awaken new interest on the subject and lead to a careful revision of the whole subject from the point of view of actually observed cases. If this newer aspect of the aphasia question will lead to its simplification, it will have done a merited service. There is no subject perhaps that is so open to the whims of the individual's taste in diagrammatics as that of aphasia. It does seem reasonable that so complicated a function as that of speech should not be separated into such artificially constructed divisions as a motor and a sensory function. It must have, in either of these assumed divisions, a mental element that no doubt lies at the foundation of the whole faculty of communication, whether by that of formal speech or in the less developed methods seen in the lower animals and the less advanced members of the human race.

In devoting some space in this review to the consideration of the more strictly clinical papers which are of some importance in the work of the year just passed, it might be worth while to glance, by way of intro-

duction, to a very remarkable paper by Head on the afferent impulses within the spinal cord. Mention is made of this paper for two reasons, first, because the conclusions arrived at are important, and then because it illustrates the best method now possible for the study of the intricate problems of neurophysiology. Head is essentially a clinician; that is, he views the problem presented by neurology largely from the point of view of its applicability to an individual case. He sees in the case itself the key to many a problem for the solution of which there can be no satisfactory animal experiments. It is readily seen, for instance, that all the problems concerned in the phenomenon of consciousness cannot be approached from the animal experiment point of view. In its large significance this would include all the finer data of sensory responses to various kinds and degrees of stimuli. Head uses then the material that is presented in a rich neurological service at his hospital and is enabled, through the care of his examinations and the avoidance of the more usual errors, to arrive at conclusions that seem to resist all attempts at criticism, that is from the technical point of view. Of course, one may differ from the conclusions as much as one chooses, but in the establishment of the data Head's position seems well-nigh invincible. The problem presented to him was somewhat as follows: He had established the fact that in the peripheral mechanism of sensory response there were ready at hand three separate systems: the epicritic, the protopathic and that of deep sensibility. When the impulses served by this mechanism reach the spinal cord, there is a change, and it is this change which Head studies with a view of grouping the sensory impulses in the cord and determining at what level the change occurs. Seventeen cases form the material. There were cases of spinal injury, paralysis of various sorts, and organic diseases of the spinal cord with sensory functions affected. The care and ingenuity by which the sensory examinations are made are beyond criticism. They form a model which all studies of this nature must reach to be considered as at all adequate. Some of his important conclusions are as follows: The spinal cord is the seat of the transmutation of most of the impulses of the peripheral into those of the secondary level of the afferent nervous system. This transmutation and recombination takes place on the same side by which the impulses enter the spinal cord. The secondary paths for sensory impulses then cross with greater or less rapidity, so that ultimately all those subserving the sense of passive position and movement and tactile discrimination have passed to the opposite side within the limits of the spinal cord. Even these sensory impulses cross after reaching the nuclei of the posterior columns.

There is to be observed in the literature of spinal cord tumors a very interesting lot of observations, especially from the point of view of operative success. Oppenheim's series of papers with Borchardt, in which the surgical side is emphasized, show a surer grasp of the topographical localization problem. There is little doubt but that the tendency that prevails today is rapidly approaching the idea that an exploration of the cord is justified in every case in which there is present a group of symp-

toms pointing to a locally acting lesion in the cord. If the effects of this lesion tend to increase within a legitimate focus of its anatomic capacity, then the suspicion of tumor is so strong that the cord should be inspected irrespective of the probable character of the tumor, or its location within the substance or external to it. Neither of these latter points can be accurately determined. An important observation has been made in respect to the symptomatology of spinal cord tumors, and that is that there can be present a tumor of the cord, or even of the dura, without pain. This is important because pain has been considered the cardinal symptom. After all the group of symptoms pointing to the localization of the process, its restrictions anatomically and the prominence of the focal phenomena and their tendency to increase or spread according to location, are the primary marks of a tumor of the cord. An important and interesting advance has been made and in the operations on the ptuitary body tumors. These have been regarded for a long time as being beyond the approach of surgery. Eiselsberg reports a case of successfully operated tumor of this region with the usual symptoms of acromegaly. The interesting thing to consider in this connection is not so much the operation and the removal of the tumor as the possibility of affecting favorably the optic nerve atrophy which is so frequently a complication. The question to be considered in this class of cases is the justification of submitting the patient to so dangerous an operation, and one which by its very nature will always be dangerous or be satisfied with the relief of the most formidable results of the tumor of the hypophysis which, of course, is the progressive blindness. An important point in the symptomatology of cerebral tumors is mentioned by Schultze, and that is the presence of arteriosclerosis of the brain and the masking of the tumor symptoms by its presence, or by causing itself symptoms which, in some cases, strongly point to the presence of tumor. It might be suggested in this connection that some of the cases of the so-called pseudo-tumor cerebri may have been cases of arteriosclerosis of the brain, in this way showing a comparative negative finding post-mortem, or when the cerebrum was exposed in the course of the operation. In the domain of clinical neurology there have been reported a great number of interesting cases that serve to throw light on the obscurer phases of disease types. An interesting example of this sort is the report by Oppenheim of a case of multiple sclerosis in the conus of the cord. Oppenheim suggests that there are probably numerous cases which are diagnosed as spinal syphilis which are really multiple sclerosis, and he calls attention to the fact that so frequently cases of this kind are forced to submit to a long period of antisyphilitic treatment under the mistaken notion that every case of spinal cord disease which does not fit in with some conventional type of disease is regarded as syphilis.

The subject of meningitis has received a great deal of attention, perhaps more than usual, on account of the renewed interest following what seems to be a favorable result in the serum treatment. Serous meningitis is the subject of an instructive paper by Riebold. He holds that it is a more common affection than is usually supposed. It is often

found as the expression of the hydrocephalus consecutive to an infectious disease. The only means of diagnosis is the examination of the spinal fluid, which in serious meningitis is sterile, containing only a few lymphocytes. The question that immediately arises in this procedure is the danger of spinal puncture in suspected cases of brain tumor, especially if the tumor might be located in the cerebellum and if it is in children. Meningism, that puzzling symptom complex which so often leads one astray in cases that apparently are typically meningitic, is treated by Tylecote. He defines it as a functional condition caused by the selective action on the meninges and cerebral cortex of toxins circulating in the blood. The possibility of this should never be forgotten, especially in doubtful cases, and the prognosis must be governed by such a chance. There is probably no definite means by which the differential diagnosis can be determined. A peculiar case is described by Lejonne Offert of unilateral paralysis of the cranial nerves. This was a case of neuritis. Such a case might have well been considered to be the expression of a basal syphilis. The unilateral localization of a polyneuritis with so extensive a distribution is certainly atypical enough to suggest that the possibilities of neuritis are very manifold.

It is quite impossible to attempt a just review of the work in clinical neurology other than to briefly mention a few cases of unusual interest. This is done merely to accentuate the idea that the informed clinical neurologist is becoming less and less impressed with types and more and more concerned with the interpretation of symptoms as expressions of definite reactions of the nervous mechanism to localized, limited, or widespread pathologic lesions. That there is a steady improvement in the methods of obtaining the data necessary for such an interpretation is evident from any consideration of the literature of a year. Certainly the year just passed is no exception to the record of other years. It has been the object of the review this year to show something of this in an abbreviated form. That so much more exists to mention than can be touched upon in this brief attempt at summing up, is to be regarded as the best possible proof of the constantly increasing activity in the effort towards the elucidation of the problems presented by diseases of the nervous system.

## PEDIATRICS.

By Alfred Friedlander, M. D.

*Feeding of Infants.* Bunge[1] continues his discussions as to the increasing inability of mothers to nurse their children, and the causes therefor. He holds that a healthy man, who wishes healthy children, should not marry a girl who was not nursed by her mother, a daughter of a tubercular family, a girl with a psychopathic taint in the family, or the daughter of an alcoholic. Morquio[2] has studied the disorders arising from breast milk. He divides them as follows: Intestinal colic; simple vomiting; gastro-intestinal dyspepsia; and infectious intoxication. It is impossible, he holds, to establish any relation, from the general point of view, between the examination of the milk and the degree of its adaptability to the needs of the particular infant. Westcott[3] suggests that in difficult feeding cases a small portion of human milk be added to the cow's milk mixtures. He has found the plan of modified wet-nursing very effective.

It is becoming realized more and more clearly each year that accurate percentage feeding does not answer all requirements in difficult cases, and that in ordinary cases, including therefore the vast majority of all artificially fed children, it is an unnecessarily complicated system. It is noteworthy that it has never found favor anywhere outside of America at all. Evidence is being adduced all the time, too, to show that the American theory of the undigestibility of the proteids of cow's milk is not tenable. At present it is being claimed that the fats cause much more disturbance than the proteids.[4] Brenneman[5], in a very suggestive article, points out that much harm is done to infants, especially in this country, by overfeeding; that the percentage method is inadequate to prevent such overfeeding. He, too, believes that the fats often cause much trouble, even going so far as to maintain that it is never necessary to give more fat than proteids of cow's milk. Neumann[6] believes that while excess of fat may do much harm, excess of proteids may cause equally great disturbance. He believes that there is also a "salt" disturbance, as a result of which spasmophilia may ensue. In order to guard against the dangers of overfeeding, it is generally suggested that the caloric values of milk mixtures be estimated[7], [8]. It is generally conceded now that, at least during the summer months, all cow's milk designed for infant food should be pasteurized and that such pasteurization should be done as soon after the milking as possible[9], [10]. Lewin[11] reports five years of unfailing success in infant feeding with undiluted cow's milk. He gives cow's milk undiluted, after the fourth week, adding merely milk sugar. His results have been excellent.

Various authors[12], [13], [14] report very good results from the use of buttermilk mixtures, and milk mixtures acidified with lactic acid bacteria. Hussy[15] has made a series of experiments with dried milk

powder, which appears to be a good surrogate for cow's milk for temporary use.

The value of goat's milk as a food for infants is being recognized more clearly all the time; for one reason, because of the fact that the goat is not so susceptible to tuberculosis as the cow.[16] It is possible that the reintroduction of the goat on a moderate scale may thus come about.

*Diseases of the newly born.* Melaena.—Shukowsky[17] has observed 29 cases in his own practice with a mortality of 62 per cent. In 14 of the fatal cases the autopsy showed lesions of syphilis. Gelatin helped in some of the cases, so did the sesquichloride of iron. In some cases, gastric lavage, with cold physiologic salt solution, seemed of benefit. Keller[18] finds on examining the vital statistics of Berlin during 1904-5, that 2 per cent of the total mortality is due to umbilical infection during the first days of life. He also takes the rectal temperature of all newborn infants twice a day so as to detect infection in its incipiency.

*Edema.* d'Astros[19] says that simple edema is very common in premature infants, usually beginning in the lower extremities. In other cases edema of the newly-born is due to acute infection of septicemic nature. The kidneys are usually involved, and in this form there is albuminuria. Certain chronic infections, notably hereditary lues, can also produce edema in the newly-born, and so can certain grave digestive disturbances.

*Engorgement of the thyroid.* Fabre and Thevenot[20] report four cases of engorgement of the thyroid in the newly-born. It is probably provoked by compression during labor. Rupture rarely occurs, though sometimes there may be interstitial hemorrhage from rupture of the vessels.

*Specific infectious diseases.* Discussing sudden death in the acute infections, Czerny[21] says that it is due to two factors—anomalies of the nervous system and over-nourishment. In scarlet fever epidemics, he finds that the highest mortality occurs in the better classes in whom overfeeding is more prevalent. Overfed children show lowered power of resistance to disease and are especially exposed to the danger of heart failure. This applies particularly to children of psychopathic families. With reference to the early diagnosis of the specific infections, Vipond[22] says that he makes it a rule to examine the lymphnodes in children with fever and absence of localizing signs. He finds the glands enlarged in all the infections, often long before the advent of localizing signs. The glandular enlargement is more marked in erysipelas, measles and rubella than it is in scarlet and pertussis. He believes that in all infections (except local ones) the toxin enters the system through the tonsils. Rotch and Low[23] have made a series of blood cultures in children; 680 children under the age of 13 were examined. The younger the child, the less the likelihood that blood cultures will be possible. In the second four years of life the authors found cultures possible in 72 per cent of the cases. The method is so simple and yields such good results that it should certainly be tried in doubtful cases.

*Scarlet fever.* Interesting results as to the question of the etiology of scarlet have followed the study of the streptococco-opsonic index in scarlet.[24] Judging from the variation in the index a scarlet fever patient is, from the beginning, the subject of a definite streptococcus infection. This result is in full harmony with the outcome of bacteriologic studies of scarlet fever. The claim that scarlet is a streptococcus disease pure and simple is, however, hardly warranted in the present state of our knowledge. Discussing functional heart disturbances in scarlet, Troitsky[25] says that the intensity of the epidemic and the severity of the disease do not have immediate influence on the intensity of the functional disturbance. These functional disturbances, while not directly dangerous, are liable in time to interfere with the child's physiologic, physical and mental development. The murmur at the apex and arhythmia of various kinds are the signs of functional disturbance most frequently seen. Schick[26] reports a number of cases to show that post-scarlatinal nephritis and lymphadenitis never develop before the 12th day and may not appear until the 6th week. Other post-scarlatinal affections are a remittent fever of undiscoverable cause, also endocarditis, rheumatic affections and relapses of the scarlet fever. Bingel[27] describes 8 cases, showing beginning degeneration of the liver from scarlatinal infections, with evident efforts on the part of the organism to repair the damage. Biehler[28] reports 4 cases of perforating ulcer of the palate in the course of scarlet.

With reference to the dietetic treatment, the French clinicians, especially, have paid much attention to the salt-free diet. It is known that in nephritis the elimination of the chlorides is interfered with, and on the other hand, that anything that throws increased work on the kidneys tends to favor the development of a nephritis. Restriction of salt, therefore, not only has a preventive action against, but also a direct curative action on scarlatinal nephritis.[29] Roger[30] reports excellent results from the use of chloral given in doses sufficient to produce light somnolence throughout the febrile period. Of 800 cases so treated, 5.5 per cent had nephritis; of 756 treated by other means 7.76 per cent had nephritis. No explanation of the action of the chloral is offered. Opinions as to the value of the Moser polyvalent serum, in the treatment of scarlet, still vary[31], [32]. In the severer cases it seems to be of benefit, especially in the toxic cases.[33]

*Diphtheria.* Marfan[34] reviews the statistics of the Hop. des Enf. Mal. (Paris) for the past five years. The figures show a constantly diminishing mortality, both total and net (excluding cases moribund on admission). Marfan concludes that the mortality of diphtheria depends upon the frequency of the malignant anginas; on the number of laryngeal cases; on the number of cases of broncho-pneumonia; especially on the number of cases with coincident measles. The greatest factor, however, in the reduction of mortality is the early use of serum. Discussing relapses in diphtheria, Rolleston[35] finds that they occur in a little more than one per cent of the cases (1300 cases in five years with 22 relapses—1.67 per cent.). They do not occur before the third week and are to be

distinguished from scarlet fever and late tonsilitis. They are usually milder than the original attack, and comparatively small doses of antitoxin are required for their treatment. Pennington[36] found bacilli corresponding morphologically with Klebs-Loeffler in the throats of 10 per cent of a large series of school children examined. In 14 per cent of the cases, such bacilli, taken from the throats of well children, produced death in guinea pigs. Convalescents from diphtheria almost always showed virulent bacilli up to 35 days after the infection. He urges prolonged quarantine of diphtheria patients. Hasenknopf and Rothe[37] report the result of their studies of cadets of a military school where there were only three cases of diphtheria. All the cadets (185) were carefully examined, but Klebs-Loeffler were found only in the three isolated patients. Other investigators also offer testimony to the effect that the bacillus of diphtheria is *not* ubiquitous.[38] Ward and Henderson[39] note the value of cultures from both nose and throat in institutional epidemics. Roehr[40] advises the dilution of antitoxin with normal saline solution in order to get rapid absorption and diffusion. He says that 3000 units given in a quart of saline solution will give as good results in one-half hour as 20,000 units, undiluted, will give in six hours. Brown, Allen and Lupton[41] describe an epidemic of diphtheria in the tuberculosis sanitarium at Saranac. The authors state positively that in the presence of a diphtheria epidemic patients with pulmonary tuberculosis should be treated, as regards the diphtheria, like otherwise healthy persons. Mild diphtheria apparently exercises no harmful effects on the pulmonary lesion; neither does antitoxin in large or small doses. Sadger[42] reports excellent results of treatment of membranous croup by the use of cold douches, suddenly and forcibly applied. This is a reintroduction of a very old method of treatment.

*Meningitis.* Jehle[43] made a series of examinations with reference to the presence of the meningococcus in the nasopharynx of persons near to, or attendant upon, cases of cerebro-spinal meningitis. He studied 35 actual cases of meningitis and examined 120 persons in their neighborhood. In no case did he find the meningococcus in the nasopharynx of persons in the neighborhood of the meningitis cases. He holds, therefore, that there is *no* contact infection. Bacteriologic studies also showed that pyocyanase is an active bactericide for the meningococcus. On the other hand, Westenhoeffer[44] thinks that the meningococcus is capable of leading a saprophytic existence in healthy individuals. He reports that healthy meningococcus carriers were recently discovered in a German regiment and barracks where no cases of epidemic cerebro-spinal meningitis had ever been known. Kernig[45] reports his findings with reference to the sign first described by him. In 208 cases of acute meningitis the sign was unmistakable in 87 per cent, in 148 cases the clinical diagnosis being confirmed by autopsy. The sign was positive in 93.7 per cent of the 82 cases of cerebro-spinal, and in 91.2 per cent of the 80 cases of tubercular meningitis. The severer the case, the earlier the sign appears. The great value of lumbar puncture, as an aid to diagnosis, is of course everywhere recognized.[46] But various authors[47, 48, 49, 50] also insist

upon its value as a remedial agent, more especially as a means of relieving pressure symptoms and affording the possibility of injection of fluids of various kinds into the canal. Injurious effects from the puncture, *per se*, are nowhere recorded. Mackenzie[51] reports a case diagnosticated by lumbar puncture, treated successfully by puncture and vaccines prepared from cultures of the meningococcus. Seibert[52] recommends disinfection of the postnasal space with a solution of equal parts of resorcin and alcohol, in all persons coming in contact with patients with meningitis, as a prophylactic measure. Wassermann[53] reports good results from the use of an antimeningococcus serum, especially when given early. Balduzzi[54] had good results from the use of diphtheria antitoxin. It was used especially for its generic action in stimulating the defensive reactions. Vorschultz[55] reports that the Bier congestion treatment is doubtless of value in relieving the headache of meningitis, though it probably has little or no effect upon the meningitic process itself.

*Tubercular meningitis.* Koplik[56] lays stress upon the following points in diagnosis: The slow onset, interrupted by periods of irritability, the irregularity of pulse and respiration, the normal or very low temperature, the absence of hyperesthesia, the anorexia, the discovery of hydrocephalus by skull percussion and lumbar puncture. Don[57] reports the case of a boy with tubercular meningitis in whom injections of tuberculin brought about great improvement, temporarily, though the child subsequently died.

*Acute serous meningitis.* Riebold[58] says that this condition is not rare, that the principal danger is from compression, which is relieved by lumbar puncture. The rapid subsidence of symptoms after such puncture differentiates the affection. The onset may be sudden and very severe, but in primary cases the outlook is good. He urges the more general use of puncture in dubious cases of meningitic aspect.

*Measles.* Eaton[59] reports a case of a child of 5, who developed a typical scarlet fever. Three days later the rash was fading, when a typical measles rash supervened. A double desquamation occurred. In the discussion following this report, several other men reported similar cases. The possibility of this double infection is therefore to be borne in mind. Weill and Dauvergne[60] report a case of measles with two distinct relapses, the case being under their own observation the entire time. They believe that this was probably not an endogenous reinfection, but a true reinoculation.

*Pertussis.* Bouchy[60] reviews the statistics of pertussis at Bretonneau hospital. The mortality here ranges from 15—20 per cent, being due to the great number of complications, from which no hospital patient is safe. He urges the abolition of the "whooping cough ward," and isolation of the patients. Concerning the bacteriology, Albrecht[61] finds the bacillus of Eppendorf very constantly in the cases dying of pneumonia consequent upon pertussis. He finds that this bacillus is not to be distinguished from that of influenza, also that this bacillus is to be found

in many cases of measles (80 per cent of his fatal cases). Magid[62] reports a case of pertussis in an infant of one year, complicated by spasm of the glottis. There were no evidences of rickets or of enlarged thymus. The author found only two similar cases on record. Kilmer[63] reports 550 cases of pertussis treated by the elastic abdominal belt (compression). Marked benefit was noted in 87 per cent of the cases. The vomiting, especially, is relieved to a very considerable degree.

*Typhoid.* Koplik and Heiman[64] find that relapses are more common in children than in adults (15 per cent of the former). They are usually mild; complications are infrequent. For a prediction of relapse no reliable signs are furnished by the interpyrexial period nor by the course, duration or severity of the original attack. Josias[65] reports to the Paris Academy that he has used antityphoid serum for the past four years. In the period previous when the cold bath treatment was in vogue, his mortality was 10-12 per cent. With this treatment (200 cases) his mortality is 3.3 per cent. He says that the treatment is safe, and urges that it be tried, if necessary, in conjunction with the baths.

*Influenza.* Jehle[66] described an epidemic due to the micrococcus catarrhalis. High fever was the only marked symptom. No complications were observed, not even coryza except in a few instances. Five-drop doses of pyocyanase, dropped into the infant's nostrils acted almost as a specific. Studying the influenza bacillus in respiratory diseases, Wollstein[67] finds that the bacilli, when they occur in the throat, complicate any disease which may be present. This is especially true of pulmonary tuberculosis, which seems a more severe course when complicated by an influenza bacillus infection.

*Tuberculosis.* Tuberculin opthalmo-diagnosis in children. Comby[68] has tested Calmette's eye tuberculin test in children. He finds the test of distinct diagnostic value, though he found the 1 per cent solution too strong, and later used a 0.5 per cent solution. In 132 children examined, the reaction was positive in 62, and post-mortem examination in 4 cases showed a tubercular focus. The negative results in 70 cases were confirmed at autopsy in 6 cases. Comby recommends the ocular reaction as valuable and harmless. V. Pirquet's cutaneous reaction[69] (local reaction after rubbing tuberculin into scarifications of the skin) is apparently also of value, though its status as a diagnostic aid cannot of course be considered as settled at this early date. In 360 tests on children it was found that a well marked difference was obtained in the reaction hyperemia, between tuberculous and non-tuberculous children under two years of age. Engel and Bauer[70] applied this test to 48 infants, the findings confirming the value of the test to a certain degree, but not to the extent that a positive response can be accepted as a certain indication of tuberculosis, at least in children. The absolute value of this test, also, cannot be considered settled as yet. Before the 5th International Tuberculosis Conference, Schlossmann[71] delivered a notable address. Study of the literature and a wide personal experience have convinced him that the death rate from tuberculosis in infancy is much

higher than is indicated by the official reports. He believes that primary pulmonary tuberculosis and tuberculosis of the bronchial glands can originate from the intestinal tract. He thinks that the persons who escape tuberculosis in childhood rarely develop it in later life, and therefore he holds that the problem of prevention of tuberculosis is essentially the question of its prevention in early life, which is comparatively easy. D'Espine[72] again calls attention to the frequency of involvement of the bronchial glands as the primary lesion and to the value of his sign in diagnosis. This is the existence of a bronchophony in the upper interscapular space. In normal children the vocal resonance ends at the 7th cervical verterbra. Where the bronchial glands are tumefied, the voice resonance is carried down to the 5th dorsal. With reference to the question of primary intestinal tuberculosis, it is of interest to note that Jensen[73] reports two cases of direct infection in infants who for a long time had been taking raw milk from a cow with tubercular udders. Orth[74] in 44 cases of tuberculosis in children (autopsies) found ten cases with primary intestinal lesions. Calmette[75] says that the mesenteric glands in children are actual filters. He holds that the first lesion is always vascular. If inhalation were the most common mode of infection, lesions in the larynx and lungs would be much more frequent. He reiterates his former assertions as regards the intestinal origin of tuberculosis, pointing out that this does not necessarily mean infection by the food. Riviere,[76] as the result of his own experience, finds tuberculin a most valuable therapeutic agent, particularly in cases of localized tuberculosis. Tubercular peritonitis is usually rapidly benefited. To a child of 1 year he gives 1-12000 mg., to a child of 5, 1-4000, to a child of 10, 1-3000, as average doses.

*Syphilis.* Marfan[77] says that a syphilitic origin for rickets is more than probable when this condition develops during the first 3 or 4 months of life, affecting the skull predominantly, with anemia and splenic enlargement. Rickets of alimentary origin comes after the 6th month; legs affected more than skull; anemia is less marked, and big belly and digestive disturbances are more frequent. Thomsen[78] notes the value of the x ray in diagnosis of osteochondritis in children who show no other syphilitic lesions.

*Rheumatism.* Conner[79] reviews the literature on the subject of the bacteriology of rheumatism, and concludes that rheumatism is a specific infectious disease, not merely an attenuated pyemia resulting from the common pyogenic organisms. While there is considerable evidence in favor of the specificity of the diplococcus described by Poynton and Payne, positive proofs of this specificity are still wanting. Poynton himself[80] calls attention to the fact that his diplococcus has been produced in pure cultures; that it has produced arthritis and cardiac manifestations in rabbits and monkeys. He holds that the fact that it is not to be found in every case cannot be considered as conclusive evidence against its causal relation to rheumatism. Discussing rheumatic carditis in childhood, Coombs[81] concludes, first, that it is a true carditis, involving all cardiac structures. Second, that the rheumatic infection is blood

borne, attacking the heart by way of its own nutritional blood supply. Third, the gravity of rheumatic carditis in childhood lies mainly in the damage done to the muscles. Fourth, that like other rheumatic lesions, it is remarkably apt to recur.

*Diseases of the digestive system.* Pyloric stenosis. There appears to be a more general acceptance of the value of medical treatment in these cases, as opposed to operative interference. In part, this is due to the more general acceptance of the view that the stenosis is really a spasmodic contraction of the pyloric muscles. Indeed, in Germany, this condition is now most often referred to as pylorospasm. Heubner[82] has found 49 cases of spasmodic contraction of the pylorus in 10,000 children. All except 3 recovered under medicinal treatment. He uses no lavage; makes the feeding intervals as long as possible; gives opium or atropin (preferably by rectum); applies warm cataplasms to the abdomen, and gives high enemata daily. While the condition may persist for months, conditions are really not as bad as after gastroenterostomy, which has a mortality of 50 per cent, while the expectant dietetic treatment now only has a mortality of 9.5 per cent. In general, Bloch[83] is in accord with this view. Sutherland[84] directs attention to the increasing number of cases treated medically in England with good result.

*Recurrent vomiting.* Comby[85] reports 72 cases. A familial history was obtained in 7 cases. 30 per cent had enterocolitis; 80 per cent had constipation. In 25 per cent there were more or less marked symptoms of appendicitis. The attacks of vomiting did not, however, cease with the removal of the appendix in all of the operated cases. Howland and Richards[86] offer a careful experimental clinical study. They conclude that as a result of a shock to an unstable nervous system, a diminished power of oxidation results, with a resultant loss of power to detoxify certain intestinal poisons, present in excess. These circulate in the blood, not being excreted by the kidneys, to which they are not brought in proper form. They are then excreted by the stomach, so that the vomiting is really eliminative and protective.

*Alimentary intoxication.* Finkelstein[87] has contributed a most valuable series of papers, embodying the result of his own careful studies, on this subject. The views do not lend themselves well to condensed abstract. He recognizes 4 stages: (1) Disturbance of normal balance; (2) dyspeptic phase; (3) decomposition phase; (4) intoxication. All stages display the "paradoxical reaction," of injury to the organism (as shown in loss of weight), when the food is increased. The syndrome comprises the following features: Troubles of respiratory system; nervous disturbances; alimentary glycosuria; fever; collapse; diarrhœa; albuminuria with casts, and leucocytosis. The condition is most often found in cases of chronic gastroenteritis, though the intoxication symptoms may supervene without antecedent symptoms. Intoxication is thus not a disease, but a reaction of an organism profoundly affected by toxins.

*Peritonitis.* Pneumococcus peritonitis. Koos[88] says that two forms are recognized in childhood, an encapsulated form and a generalized purulent form. The onset is always acute. The presence of fluid in the abdomen can be detected much earlier in this than in tubercular peritonitis. The prognosis of the encapsulated form is not bad if the diagnosis be made and early operation be had. The diffuse form has a much higher mortality. Treatment of both forms is purely surgical. The affection may be primary, infection occurring through the intestinal tract, or in girls through the genitalia. More often it is secondary to a pneumococcus process elsewhere in the body.

*Tubercular peritonitis.* Schmid[89] offers a critical review of the literature and a study of cases followed for a long period of time. He finds that the general trend of opinion now is that operation should not be speedily resorted to. Medical treatment of all kinds should be skillfully and persistently tried, though there is always the necessity for individualization of cases. The operation is contraindicated where there is coincident tubercular enteritis or renal tuberculosis.

*Alcoholic cirrhosis of the liver in childhood.* Jones[90] reports two cases of alcoholic cirrhosis, one child being 16 months old, and the other 2 years and 11 months. Though there was an alcohol history in both cases, the alcohol had not been given in excessive amounts. The author has collected 74 cases from the literature. He calls attention to the sensitiveness of children to alcoholic poisoning in general and holds that the possibility of production of hepatic cirrhosis should be taken into account when ordering alcohol for children.

*Diseases of the respiratory system.* Pneumonia. Hayem[91] says, with reference to the diagnosis of lobar pneumonia in childhood, that its difficulty is enhanced by the late appearance of the physical signs and the predominance of the nervous phenomena. Weill and Thevenot[92] find that the x ray may be of distinct diagnostic value. True pneumonia with fibrous exudate always gives a distinct shadow. The parallelism between the physical signs and the radiologic finding is practically constant. Goodman[93] reports the case of a child of 8, with a typical frank pneumonia lasting 12 days. The highest temperature at any time was 99.6°.

*Diseases of the blood.* Anemia infantum pseudoleukemica. Koplik[94] presents a detailed report of 9 cases, occurring in children ranging from 11 to 20 months. With this there is given a study of the literature. He holds that there is nothing pathognomonic in the anatomical changes in spleen, liver, bone marrow or other organs. He believes that the affection is probably a severe secondary anæmia with or without marked leucocytosis. The cases reported as terminating in true leukæmia are really cases of leukæmia from the outset. Cases of true V. Jaksch disease, if they terminate fatally, do so through some intercurrent disease—pneumonia or tuberculosis. Simon[95] offers a classification of the anæmias of infancy: (a) Simple anæmia after hemorrhage, acute infections, digestive disturbances, rickets; (2) chlorotic anæmia, due to digestive disturbances, milk diet kept up too long, use of food poor in iron; (c) pernicious anæmia, with the same etiologic factors as in the

adult; (d) splenic anæmia, with several subdivisions. Special studies of these various varieties are given by various French observers[96], [97], [98].

*Leukaemia.* Benjamin and Sluka[99] contribute a careful statistical study with appended bibliography. With reference to x ray treatment, they find that the lymphatic form is neither greatly or favorably influenced. The results of x ray treatment are much better in the myelogenous form. Potpeschnigg[100] reports the case of a boy of 2½ years old, taken suddenly ill with edema, without heart or renal lesion, and ecchymoses. The blood picture was that of anæmia infantum pseudoleukæmica-Jaksch; liver and spleen were enlarged. The child improved; three weeks later it was again admitted to hospital, with marked glandular bone pain and the blood picture of lymphatic leukæmia, which condition was found at autopsy.

*Diseases of the heart.* Endocarditis in infancy. Lemp[101] reports 7 cases. The local signs are either wanting or not marked; no bruit; no increase in precordial dullness; there is lividity of the face, often extreme general cyanosis; rapidity and irregularity of the pulse with great dyspnœa. Discussing heredity in relation to heart disease in early life, Gallì[102] says that three types may be differentiated: (a) Hereditary aortism with diminished arterial resistance, producing mild lesions in early life and severe ones in the 4th or 5th decade; (b) endocarditic affections. Rheumatic children with rheumatic parents, who get valvular lesions early in life; (c) myocardial affections—occurring in children with inherited tendencies to this form of trouble. Symptoms of myocardial insufficiency ensue on even very slight exertion. The vessels are normal. Neumann[103] discusses impure heart sounds in children. He has records of 71 cases under 5 years, 89 between 6 and 10 years, and 20 in older children. The impurity of the heart sounds comes on suddenly, usually preceded by catarrhal affections of the upper air passages. Except for slight cyanosis and dyspnœa and slight arhythmia there are no signs except the impure sounds, yet there is no question as to the impaired condition of the heart muscle.

*Diseases of the uropoetic system.* Pyelitis. Fisher[104] says that three types of pyelitis are to be seen in infancy: (1) Intermittent fever, progressive emaciation and constipation. (2) Cases with painful and frequent micturition, often without fever. (3) Cases with marked digestive disturbances, usually marked by passage of scybalous masses and feces mixed with shreds of membrane. There is anorexia but no fever. The diagnosis is to be made by microscopic examination of the urine. The general plan of treatment recommended includes rest, warm local demulcent baths, with a diet of milk, alkaline waters, cereals, fruits and gelatin. No meat or eggs in the acute stages. Sodium benzoate and urotropin as medicine. Discussing tuberculosis of the urogenital apparatus in children, Trumpp[105] says that every cystitis, with pus in urine, long continued, with blood at times and marked irritation of the bladder, where the ordinary cystitis treatment is of no avail, should awaken suspicion of tuberculosis.

*Diseases of the glands.* Enlarged bronchial glands. Boujarel[106] calls attention to expiratory stridor as a frequent sign of enlarged bronchial glands, the stridor being distinguished from congenital stridor by its late appearance, expiratory character and progressive increase in intensity. The author also finds the x ray a valuable diagnostic aid in this condition. D'Espine calls attention to the value of broncophony heard as low as the 5th dorsal as a sign of enlarged bronchial glands. A careful study of 300 cases has convinced Donoghue[107] that enlarged glands of the neck are not, primarily, tuberculous; that they bear the slightest relation, if any, to general or pulmonary tuberculosis. They are due to a mixed infection of pus producing bacilli and will quickly resolve if the source of infection is removed before the glandular tissue becomes disorganized. Hess[108] has examined 300 children with special reference to enlarged epitrochlear glands. In only 15 of these cases were the epitrochlears bilaterally enlarged, and in 9 of these cases there was evidence of syphilis. The author therefore believes that this may be a sign of diagnostic value.

*Status lymphaticus.* Friedlander [109] reports a case of status lymphaticus in an infant, successfully treated by application of the x ray. Under its use the thymus and the enlarged bronchial glands rapidly diminished in size and the child's general condition improved remarkably. Two years after the treatment the child is in excellent condition, presenting no abnormal signs or symptoms.

*Arthritis.* Pneumococcus arthritis. Furrer[110] reports a case in an infant of 16 months, and tabulates 26 previously reported cases in infants and children. The condition was secondary to pneumonia in half the cases. The larger joints are most often affected; the knee twice as often as the other joints. The complication most to be feared is general extension (sepsis). The mortality in children is about 30 per cent.

*General diseases. Rickets.* Esser[111] ascribes the origin of rickets to overfeeding of infants by breast or bottle. Experiments on animals have confirmed clinical experience in this regard. Lymphoid cells and young forms of neutrophiles increase rapidly as a result of overfeeding, testifying to leucocytosis resulting from abnormal functioning of the bone marrow, and this in turn entails disturbances in bone formation.

*Gout.* Fraenkel[112] reports a typical case in a 4-year-old child, who had night pains at intervals for one and one-half years until a typical attack cleared the diagnosis.

*Diabetes.* Lazard[113] discusses the subject of diabetes in childhood very thoroughly. On account of the danger of rapidly ensuing coma in childhood, the antidiabetic diet should not be too strict. An absolute meat diet is by all means to be avoided. In many cases it will be necessary to give children considerable amounts of carbohydrates, oftentimes even sugar itself.

*Developmental errors.* Infantilism. Schuller[114] describes three forms. (1) A dystrophic form due to inherited alcoholism, syphilis, tuberculosis or gout. (2) Infantilism from disease of the hemopoetic organs, thyroid, hypophysis, suprarenal, thymus or pancreas. (3) Infantilism

from primary diagenitalism, the purest form, possibly to be explained on the basis of lesion of the testicles (or ovaries) as experimental and clinical study would indicate.

*Achondropplasia.* Porter[115] reports the disease as occurring in six members of a family, constituting three generations. It occurred only in males, no females being born in the three generations.

*Miscellaneous.* Thiemich and Birk[116] have traced the later history of 64 children known to have had convulsions in infancy. In 37 per cent heredity was an unmistakable factor in the convulsions, and in 13 per cent there was neuropathic heredity, a total of 54 per cent of proven heredity. No instance of epilepsy was found in the parents or family of any of the children. Two-thirds of the children were found later to be below the average of intelligence or morals. Some of the others were "only" children, and the writers add that being an only child affords a predisposition for nervous affections. The later development of the children with larynogospasm alone did not differ in any respect from that of the children with pronounced eclampsia. Only a very small percentage of the eclamptic infants developed into normal children.

Attention may be called here to the epidemic of *acute anterior poliomyelitis* in New York City. It is not necessary to go into technical details in this department review, but it may be noted that much research work is being done, particularly with reference to etiology[117], [118]. A thorough investigation of the epidemic is being conducted by the New York Neurological Society and the Pediatric Section of the New York Academy. With the resources of the Rockefeller Institute and the large hospital laboratories to assist, it is hoped that much valuable information concerning the condition may be obtained.

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# ORTHOPEDIC SURGERY.

By Nathaniel Allison, M. D.

The work of Sir Almroth E. Wright on the principles of opsonotherapy has called the attention of many observers to the application of this theory to the treatment of tuberculous disease of the bones and joints. As Wright[1] has stated, it is necessary that those attempting to employ this form of treatment be acquainted with the physiology of the immunizing response, that they realize the conditions under which bacteria cultivate themselves in the organism, that they understand under what circumstances bacterial products, or bacteria as the case may be, are conveyed into the blood stream from local foci of infection. Added to this must be a knowledge of how the organism reacts to such autoinoculations, and there must be an understanding of the conditions necessary to bring the leucocytes and the bacteriotropic substances which are the instruments of immunization into operation on bacteria which are cultivating themselves inside the organism but outside the blood stream. Ridlon[2] has made a preliminary report on ten cases of chronic joint disease treated by tuberculin injections after the methods laid down by Wright, and concludes that a low tuberculo-opsonic index with local joint symptoms may be accepted as evidence of joint tuberculosis. But a practically normal tuberculo-opsonic index, together with local joint symptoms, neither proves nor disproves joint tuberculosis. When the diagnosis of joint tuberculosis has been made, a high tuberculo-opsonic index should be maintained, if possible. With a high tuberculo-opsonic index an operation for the removal of all or part of the local disease may be undertaken; not so with a low index. If use of the diseased joint lowers the opsonic index, the joint must be protected; if it does not lower the index, it may be permitted; if it raises the index, it should be insisted upon. General elevation of the temperature following a tubercle injection indicates too large a dose. A persistent lowering of the index during treatment by tubercle injections indicates that the injection has been given at the wrong time, during what Wright calls the negative phase, instead of during the positive phase.

R. Tunstall Taylor and E. A. Knorr,[3] working on this subject, have drawn the following conclusions: That the question of the size of the dose is important and the opsonic index is the best guide to this, showing at once an overdose and when vaccination is given at too frequent intervals, which no other clinical means will show. They offer, as supplementary means to register the progress of cases subjected to this form of treatment, the use of the x ray to note the changes if any effected by vaccines or tubercle injections upon the disease foci in the bones.

Freiberg,[4] following the encouraging reports from European observers as to the efficacy of Marmorek's serum in the treatment of joint tuberculosis, has employed this serum in the treatment of ten cases. It may be well to explain that Marmorek's theory and serum are based

on the belief that tuberculin cannot be regarded as the toxin of the bacillus tuberculosis, but must be looked upon as a substance capable of calling forth the increased production of true toxin from the bacilli; normal organisms do not react, because no bacilli are present; hypertuberculous animals, on the other hand, do not react because the enormous quantities of bacilli have already called this forth to the degree of saturation. Marmorek's object therefore was to subject the tubercle bacilli to such conditions outside the body as would favor the production of the veritable tuberculo-toxin. Serum drawn from calves which have been given a series of injections of a suspension of guinea-pigs' leucocytes in normal saline solution is used as a culture medium for tubercle baccili. The filtrate from this culture Marmorek has demonstrated to be a tuberculo-toxin, and by its means has succeeded in immunizing experimental animals against infection with tubercle bacilli. It takes seven to eight months to immunize a horse and serum drawn from this horse may be used therapeutically. The experience of Freiberg with the ten cases above referred to does not coincide with that of Hoffa, who has stated that "Marmorek's serum has a curative action on the course of the tuberculous process which may be termed specific." In two of Freiberg's cases there was no perceptible effect whatsover. In none was he able to record a cure though he states that this may be due to the short time of observation. In six of the cases improvement of general or local conditions was noted, which would seem to be attributable to the use of the serum. In two of these the improvement of the general condition was considered remarkable. He believes that scientific observers should be very cautious about accepting cilnical reports as evidence of cure, and that it is likewise incumbent not to look for the unreasonable in these recoveries; that failures of the past should not be allowed to destroy our scientific optimism nor make us condemn precipitately.

Jeans and Sellards[5] have studied nine patients treated by means of tuberculin of their own preparation, observing the tuberculo-opsonic indices of each patient, and conclude that the patients are too few for any general conclusion to be drawn. Other dosage and other interspacing of dosage might have been more effective and perhaps other forms of tuberculin might have given better results. They are of the opinion that the clinical result and not the opsonic curve is the standard to judge improvement.

Though results have been far from positive and though the technique and laboratory equipment necessary to carry out these various means of treatment are quite elaborate, it seems from what has been attained that we are on the edge of a great scientific advancement. There is perhaps some truth on the other hand in the statement made by Watson Cheyne that "in joint and bone diseases, where no operation would formerly, or now, have been considered necessary, by all means add the use of tuberculin to other methods employed. But blindly to convert the practitioner into an immunizator, as Professor Wright puts it, is, I believe, a totally retrograde step."

Painter and Rogers[6] point out the fact that the orthopedist, in common with many specialists, is in danger of losing the general surgeon's point of view, and as a means of bringing him back to a broader conception of disease than that which is fostered by the pursuit of a narrow line of practice or research, have contributed a paper entitled "Neoplasms and Their Relation to Orthopedic Surgery." At the present time much attention is being paid to chronic joint disease in the adult, and it is doubtless for this reason that the orthopedic surgeon is seeing more new growths than formerly fell to his lot. Malignant bone tumors are more common than benign ones, and for this reason their early recognition is of great importance. Epithelial growths are more common than those derived from the connective tissue, because epithelial cells are not found in bone, neither are there glandular structures present in such tissue, in which carcinomatous changes may take place. In consequence of this fact primary carcinoma of bone is of extreme rarity. On the other hand metastatic osseous carcinoma and epithelioma are not very uncommon. Sarcomata may be either primary in bone or metastatic. Of the primary tumors central or giant celled sarcomata and periosteal sarcomata are the most common. True myelogenous sarcomata are very densely packed with giant cells, and these are of large size; they do not possess, as is the case with sarcomata in general, only a few giant cells. The author points out the necessity for considering these growths in a differential diagnosis of a lesion located in the skeleton. He shows that the literature is very rich in reports of tumors of the bone, and reports eighteen cases in considerable detail because all of them presented some difficulties in diagnosis, and in many of them diagnosis could not be made, or at least was not correctly made, until operation permitted an histological examination.

Coley,[7] in an article entitled "Sarcoma of the Long Bone," aside from pointing out the fact that the use of toxins administrated to patients affected with sarcoma is no longer in the experimental stage, gives many valuable suggestions as to the diagnosis of these growths and has carefully studied a large group of cases. He lays special emphasis on the differential diagnosis, citing as the conditions specially to be considered bone cysts, tuberculosis, syphilis and osteoarthritis.

Calot,[8] in an article entitled "Intra-articular Injections at the Hip: Their Technic and Use in the Treatment of Hip Diseases," has given a new method and reported some very favorable results. The inaccessibility of the hip joint for injection and the dangers attendant upon such a procedure are fully discussed. From experiments on the cadaver and considerable practical experience, he concludes that the point of election for such injections lies below the clural arch, outside the femoral vessels; at a point where the femoral head can be palpated. His rule is as follows: The skin is pierced at a point lying 2 to 2.5 cm. in a child (8 to 14 years), or 3 cm. in the adult, below a horizontal line passing between the pubic spines and the same distance outside the femoral arteries; perhaps a better direction, applicable to all cases, is to pierce the skin half way up a vertical line drawn from the anterior superior

spine to the femoral vessels. The needle must not be placed directly in from before backward, but must be inclined upward and inward at at angle of about 15°; it is carried down to a point where the bone is felt and then the handle is pushed transversely downward, keeping the point in contact with the bone. The injection is made with force so that the liquid may penetrate to the lower depths of the acetabulum. After the withdrawal of the needle, a tampon is held very firmly over the opening for a few minutes to prevent the escape of liquid and favor a transmission to all recesses of the joint cavity. He uses two solutions. In acutely active and in light cases: oil 50 gms., ether 25 gms., creosote 3 gms., iodoform 7 gms., 3 to 10 gms. according to age. In the fungus type the same quantity of the following is used: glycerine 20 gms., naphthol-camphor 3 gms. This treatment he uses every five to six days for two months, then an intermission of six months is allowed, ordinary orthopedic measures meanwhile being continued. The necessity for more definite measures to combat the progress of tuberculous disease is well recognized. Those familiar with hip disease know that the majority of cases have a shortening of three cm., more or less, complicated by vicious position and a more or less solid ankylosis; furthermore, cases with abscess are usually under treatment over two years and have more marked destruction and worse end results. Calot claims remarkable results, both in checking beginning disease and in quieting down old destructive processes by the use of the above method. Though little success has followed intra-articular injections of tuberculous joints in this country, the above paper states so definitely the establishment of early cures and the amelioration of old and well established symptoms that it seems the method recommended by Calot is worthy of serious consideration and trial at our hands.

Steward,[9] in making some clinical remarks on the treatment of surgical tuberculosis, calls attention to the fact that the general condition of the patient should be improved as much as possible before operation by recumbency in the open air and proper feeding. Incisions should then be made where the structures overlying the abscess are thick, so that their subsequent suture will leave a considerable mass of tissue between the skin and the abscess sac, for if the incision pass through the skin, which is thin and adherent to the sac, the sutures will pass directly through the abscess cavity and thus form lines along which direct infection will be liable to occur, as for example, in the case of psoas abscess, it is preferable to make the incision above Poupart's ligament. It is well to make the opening into the sac to one side of the skin incision, so that, should the abscess refill and the scar in the sac stretch, the parts immediately over it are not so liable to become thin and give way. The use of the finger to explore the cavity should be avoided and curretting should be carried out as gently as is consistent with the complete removal of the lining cavity. The application of strong antiseptics is of doubtful utility. Closure of the wound should be made complete and thorough by the use of several rows of interrupted sutures,

preferably of catgut. A drainage tube should on no account be used, subsequent dressings should be carried out with care to avoid contamination and the parts should be fixed for a prolonged period. He regards aspiration as inefficient and risky in that fluid contents only can be removed and the needle tract is liable to become the seat of tuberculous disease. He believes in the prolongation of conservative methods and in the use of tuberculin as a therapeutic agent.

As a means to hasten the closure of tubercular sinuses, Sever[10] has employed the Bier suction treatment on sixteen cases, and states that though the conditions with which the children were surrounded tended to improve them in every way, it is nevertheless possible to definitely state that these conditions alone would not have been enough to have caused them to do so well in view of our past experience with similar conditions, and without the use of the suction treatment. Eight, or one-half, of the cases reported were either wholly healed or markedly improved, generaly and locally. In five the conditions were not apparently improved locally, but there was distinct gain in weight and color-index. Three cases lost ground to such an extent that the treatment was not continued. He believes that this cupping will undoubtedly cause a stimulation of the healing process in the majority of cases. It is simple and easily applied and carried out.

Mechanical supports are discussed by Napier[11] in such a way as to define the principles upon which their use depends in the treatment of diseases of the bones or joints, of fractures or dislocations, and in certain injuries, and for the relief of defects or the correction of malpositions. A mechanical support should be regarded only as an aid. The failure to recognize it as such leads to a defeat of its purpose as a therapeutic agent. Constantly one sees the reliance placed by both patient and surgeon on an insole for flat foot, and a brace or plaster corset for lateral curvature. It must never be forgotten that the artificial support replaces the natural support supplied by the muscles, which as a result become weakened. If complete rest and fixation are not essential, the muscles should be exercised, for brace weakness follows brace use. The prevention or correction of deformity should be carefully worked out when using a mechanical appliance, force should be applied only in the right direction, and the influence of growth on deformity must be remembered. The effect of the support on the rest of the body as well as on the particular region which demands its use should be carefully considered. The understanding of these conditions requires careful study and constant observation on the part of the physician undertaking to employ them, and he should never intrust a case needing a brace or mechanical support to the sole care of an instrument maker.

Silver,[12] in commenting on the causes of failure in tendon grafting, states that in recent years much has been done, both clinically and experimentally, to place these operations upon a firmer basis; that a study of the causes of failure in the light of our present knowledge may prove of value, and that these causes fall conveniently into the following

divisions: (1) The selection of unsuitable cases; (2) inaccurate determination of the extent and degree of paralysis; (3) defective plan of operation; (4) imperfect operative technic, and (5) insufficient after-treatment.

It is of the greatest importance that the paralysis be not of a progressive type, that is, that it has reached its final or permanent stage. The muscular power remaining should be sufficient to justify operation. The existence of deformity is a contraindication to immediate operation. When operation is decided upon it is important that it be planned with simplicity and that the relative value of the various muscles involved be thoroughly appreciated. The muscles transplanted should be put under sufficient tension and the sutures employed should be strong enough to insure perfect union. Adhesions are always present to a greater or less degree. Their influence is naturally greater where the incision has been made in firm, unyielding tissue. The effect of sepsis on adhesions need only be mentioned. The period of fixation recommended generally is from six to eight weeks. Earlier attempts at the use of the part are apt to followed by stretching of the young tissue. The removal of the cast ushers in a period of especial risk. As great care is demanded at this time as at any time during the previous part of the treatment.

Kirmisson,[13] in an article on tendon transplantations in the paralyses, says that today there are recognized two principal methods of tendon transplantation: (1) the transplantation of tendon to tendon after the early method of Nicoladoni; and (2) the periosteal transplantation of Lange of Munich. It is difficult to judge between these two methods and great diversity of opinion exists in this respect between different authors. Vulpius is opposed to periosteal transplantation and to the use of artificial tendons of silk, whereas Lange is opposed to partial transplantation, saying that it is impossible that a single muscle, as for instance the tendo Achillis, when it is divided several times, will accomplish the functions of flexion and extension. In a general way it appears better to employ total transplantation. In this connection one point is important, that the transplanted tendon, or muscle, be made to follow a direct course in exercising its pull. The proceeding recommended by Codivilla, which consists in making the transplanted muscle traverse the interosseous space instead of having it describe a long oblique course about the side of the foot, seems a valuable surgical measure. For the relief of spastic paralysis the author is of the opinion that tendon transplantations have a much more limited scope. He has frequently shown the good results that follow transplantations of muscles at the elbow in infantile hemiplegia. For the relief of Little's disease, on the contrary, tendon transplantation does not seem to be advisable. The results which follow transplantations of the nerves have been too infrequently reported, and then of so recent a date that it is not possible to form a judgment regarding them. It is quite possible, however, that they will some day encroach upon the field now occupied by tendon transplantations as surgical procedures; perhaps they may ultimately supplant them entirely.

Lange[14] has noted that silk used to make artificial ligaments is liable to induce an abscess when sterilized by merely boiling it in water. When boiled in a solution of bichloride of mercury it induced an aseptic secretion. He has obviated this by impregnating the silk with paraffin after boiling it in bichloride solution. He advocates the use of silk ligament for paralyzed flail joints. He would restrict arthrodesis to patients over twenty, who insist upon it. Under other conditions he thinks that we have better means at our command. In using this silk it is important to allow sufficient time after removal of the dressing for the silk to become encased in connective tissue before the limb is used freely. It should be used enough to keep the silk ligaments stretched, but on no account to pull them out or to loosen them before they have their firm connective tissue supports. The connective tissue does not form until its formation is stimulated by gentle functional use of the silk ligaments.

Hoffa,[15] in an article on "Chronic Articular Rheumatism and Arthritis Deformans," divides these diseases of the joints into (a) infectious diseases and (b) non-infectious diseases. Under the heading (a) he includes all chronic infectious joint diseases and gives as types (1) primary infectious chronic joint diseases: polyarthritis, chronica, primitiva or destruens; (2) secondary infectious chronic joint diseases (a) secondary chronic joint rheumatism, a result of acute articular rheumatism; (b) chronic articular rheumatism following acute infectious diseases, e. g., scarlet fever, measles and gonorrhoea, etc.; (c) tuberculosis; (d) syphilis. He divided the non-infectious chronic joint diseases under the following heads: Traumatic chronic arthritis, irritative chronic arthritis, constitutional or dyscrasic chronic arthritis—(a) gout; (b) hemophilia – arthritis deformans—(a) spontaneous; (b) reactive; (c) neuropathic, functional chronic arthritis (joint neuralgias, hydropsintermittens). As a treatment for these various conditions he recommends supporting apparatus, and calls attention to the fact that the resection of the joint has often been performed with good result. The treatment at spas combined with mechanical means has given the best result; massage is also of use where there is atrophy of muscles.

Midelton[16] commends the use of blister counter-irritation applied in the region of the cervical and lumbar enlargements as a treatment for rheumatoid arthritis, and gives notes on five cases in a series of twenty. Several of these cases were extremely feeble and responded favorably to this treatment. The author is not altogether in accord with the view advanced by Latham that this disease is the result of irritative and destructive conditions in the regions of the cord, but believes it to be due to a cerebro-spinal toxemia.

Whitman[17] has contributed a valuable paper on the consideration of the causes and the characteristics of the weak foot. This subject has also been carefully considered by Keppler,[18] both authors agreeing that apparatus should be used as a corrective measure alone, and that these cases depend for their relief and cure entirely upon a regained muscular control and proper attitude in walking and standing.

Bradford and Sever[19] have gone over the result of the treatment of cases of acquired and congenital muscular torticollis at the Boston Children's Hospital since 1879, fifty-three in number, and conclude that it is best to operate on cases between the ages of two and twelve years in order to insure a good result and prevent permanent bony deformities. They recommend open incision with complete division of the two heads of origin of the sternocleidomastoid muscle and the retention of the head in a plaster cuirass for a period of two months.

Allis[20] has contributed a comprehensive paper on congenital dislocation of the hip, and concludes that the Lorenz dressing is sound as a mechanical principle and that flexion and abduction are necessary only to the end of the first month; plaster of paris does not permit of the latitude of exercise that should be employed in these cases. He believes that the child can be placed in an apparatus that will allow it freest motion in flexion and extension for six months, keeping it meanwhile in a recumbent position. The advantage of this reclining posture is that when the child is exercising its limbs there is no greater weight upon the newly occupied socket than that of the limb itself. He reports two perfect anatomical recoveries in two children, both under three years of age, who were treated according to this method.

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## GENITO-URINARY SURGERY.

By H. McC. Johnson, M. D.

A new impetus has been given to the operative technique in cases of tumors of the bladder, by Kolischer and Schmidt (*Jour. Am. Med. Assn.*, July 27, 1907). According to them, operative interference in tumors of the bladder is not, at the present time, conducted according to the generally accepted rules of surgery, each operator following his own notions and fancies. One essential principle, however, is apparent: Benign tumors should be approached from the inside, malignant tumors from the outside of the bladder. The intrinsic qualities of a benign tumor are such that it is manifestly sufficient if its mucosa, submucosa and pedicle alone be removed. In approaching such tumors, there are two methods at hand: One the endovesical, through an operative cystoscope; the other through an incision in the viscus. In the former method, after the tumor is removed with a galvano-caustic snare, if necessary the stump may be again cauterized, the severed tumor being either picked up with forceps introduced through the cystoscope, or pumped out with an evacuator. The other method of removal of a benign tumor involves its complete exsection, after the bladder has been opened by an incision. In order to gain space for a generous incision, the bladder should be freely exposed. The tumor and its face are brought into full view, and made easily accessible, either by catching the base of the bladder with sutures, or by having an assistant make pressure from the rectum or the vagina, as the case may be, and thus force the base and fundus of the bladder upwards. Sutures are now run beneath the insertion of the tumor, and promptly tied one by one in the path of the operator, as he is excising the base of the growth. This detail in technique prevents the hemorrhage, which otherwise would flood the field of operation, and the inconveniences therefrom. If the tumor be located close to the vesical portion of one of the ureters, one end of a ureteral catheter is run a few inches up into the ureter previous to the insertion of the preventive stitches, and the other end is passed out through the internal orifice of the urethra, and thence outside by way of the urethra. Should some of the preventive sutures encircle the vesical end of the ureter, the catheter would be found engaged. In this case, it is simply left in place for a week or so, until the healing process has progressed sufficiently, and then withdrawn. Careful inspection of the bladder should be made, to discover any smaller sized papillomata, particular attention being paid to the parts opposite the main tumor. The bladder is closed by two layers of sutures, and suspended to the abdominal wall to exclude any dead spaces, and the incision closed without drainage.

In cases of malignant tumor, after freely exposing the bladder and opening it as close to the side of the tumor as is compatible with surgical demands, the growth is removed with a section of the entire thickness

of the bladder wall to which it is attached. This resection, in case it does not involve more than one-third of the bladder, should be followed by total suturing of the viscus. After the organ is closed a cigarette drain is run down to the deepest point of the bed of the wound, the bladder suspended to the abdominal wall, and all closed up save for the point of drainage. The permanent catheter should never be employed in cases of partial resection and subsequent complete suture of the bladder. If necessary, the patient is catheterized at appropriate intervals. Should the tumor involve the ureteral opening, the bladder is dissected out to such an extent that not only complete excision of the tumor base becomes possible, but also the vesical end of the ureter is laid bare. The ureter is clipped off at its insertion into the bladder, and the exsection of the tumor base, including the ureteral mouth, is accomplished. The stump of the ureter is now reimplanted into the upper end of the excision wound, and the wound closed as completely as is feasible. In those cases in which the radical operation is no longer possible the bladder may be opened from above and the ulcerated surfaces cauterized, or permanent kidney fistulæ may be established.

According to Belfield (*Annals of Surg.*, Jan., 1907), suprapubic cystotomy affords the best access for intravesical operations, and when primary union of the incision is secured, leaves nothing to be desired. Usually, however, primary union is not secured, and leakage into the prevesical space commonly occurs, with all of its sequelæ. To overcome this, the author suggests drainage of the prevesical space into the perineum. When ready to close the suprapubic wound, the membranous urethra is opened with a grooved staff, the gorget introduced and the staff removed. A small trocar and canula is passed from above, along the anterior surface of the bladder and prostate into the groove of the gorget. The trocar being withdrawn, a few silk-worm threads are threaded through the canula and along the gorget, out through the perineal wound. A large soft catheter is introduced into the bladder for perineal drainage. The suprapubic incisions in the bladder and abdominal wall are completely closed, except where the threads protrude, the anterior wall of the bladder being anchored near the recti muscles. Any urine which may leak through the bladder wound and the tissue fluids find ready exit at the bottom of this space.

Swinburne (*Am. Jour. of Urol.*, Feb., 1907) considers the crushing operation in properly selected cases of vesical calculi as the operation of choice, as the patient seldom need be detained longer than two days after it, while the cutting opration, if performed when possible under the ideal condition of completely closing the bladder wound, does not permit the patient to go about under two weeks. Muren has done 15 litholapaxy operations without any anesthetic, the main complaint of the patients being the operation of the evacuating apparatus.

Ware says (*Am. Jour. of Urol.*, May, 1907) that hematuria should be divided into painless and painful varieties. The former, when void of any other symptoms, is peculiar to new growths, while the latter may be significant of any pathological condition of the bladder. It is

therefore desirable to keep in mind the age of the patient. In infants we are most likely to encounter stone; in youth inflammations of the bladder dependent on infections; in middle life new growths added to the aforesaid, and in old age enlarged prostate and stone. As there is nothing pathognomonic in the various hematurias due to pathologic conditions of the bladder which distinguishes them from each other, or differentiates them from renal hematurias, that we can single out by any other mode than the cystoscope, there is therefore all the more justification to adhere to the academic distinction of painful and painless hematuria, and the hematuria in relation to age and its bearing on urinary disturbances.

After having been a warm partisan of the perineal route for performing prostatectomy, Pousson (*Ann. des Mal. des Org. Urin.*, Feb. 15, 1907) has now turned to the suprapubic method with added zeal. This change of opinion has come after a personal experience with fifty cases, twenty-eight of which were done by the perineal and twenty-two by the suprapubic method, the former giving an operative mortality of 10.7 per cent and the latter a mortality of 13.6 per cent. While the death rate by the perineal route is slightly less, yet other reasons cause the author to give preference to the suprapubic method. In the first place, the anatomic simplicity of the region traversed by the high method overbalances the complexity of that by the lower route. By the hypogastric the cul de sac of the peritoneum is the only obstacle to be avoided, which is made much more easy by the Trendelenburg position. In the perineum the bulb of the urethra and the rectum are to be avoided, the author having opened the rectum twice in his twenty-eight cases. Again, the great facility with which the gland may be enucleated suprapubically is the second good reason for preferring it. By the perineal route, this enucleation is slow and laborious. The most frequent obstacle to radical extirpation of the gland through the perineum is the extreme thickening of this region in the obese. True, in these cases the same difficulty is encountered suprapubically, but may be overcome by making a long cuticular and subcuticular incision, when even the whole hand may be put into the bladder. Post-operative hemorrhage is more likely to be encountered upon operating by the suprapubic method than by the perineal, but by making a large opening in the bladder and employing an electric light for illumination, the hemorrhage may be controlled through thermocautery, ligature or tamponade. While the perineal route furnishes the best drainage, yet by the use of a large drainage tube the bladder may be thoroughly drained suprapubically. A suprapubic wound heals quicker and affords better facilities for removing the whole gland.

Two cases of prostatic hypertrophy, in which improvement followed the use of the Roentgen ray, are reported by Tansard and Fleig (*Ann. des Mal. des Org. Urin.*, Dec. 15, 1906). They state that decided amelioration takes place from the radiotherapy, through atrophy of the gland. The treatment by this means is especially indicated in prostatics

that have not reached the period of retention, in young prostatics and in those cases in which operation is not desired or indicated.

Ballinger (*Southern Med. and Surg.,* Dec., 1906) notes that the presence of albumen and albumose in the urine voided after massage of the prostate, when the urine before massage is normal, is as reliable in the diagnosis of prostatitis or an abscess draining into the urethra as renal albumen is in the diagnosis of kidney disease. The recognition of this prostatic and vesicular proteid affords a very simple method of making a positive diagnosis of marked prostatitis and vesiculitis, as well as the mild, obscure cases, whether a microscope be at hand or not. Owing to the alkalinity of the prostatic secretion, and to the fact that deutero-albumose (the proteid constantly found in chronic cases) is not precipitated by boiling, the heat test, as ordinarily applied, will not be satisfactory. Picric acid and citric acid will, however, produce a cloudiness, or precipitate, if added to the boiling urine and allowed to stand until cool. This will disappear again when heated, if due to albumose. Robert's solution, as modified by Boston, containing one part of nitric acid to ten parts of a saturated solution of magnesium sulphate, applied as a layer test, will demonstrate very small quantities of albumen or albumose.

Drainage of prostatic abscesses through the ischiorectal fossa is advised by Lusk (*Ann. of Surg.,* Jan., 1907). This operation is suggested for cases of prostatic abscesses which have not ruptured into the urethra, and present a tense, elastic tumor, bulging towards the rectum. This route is preferable, as it is direct and easily accessible, with no danger of injuring the rectum or urethra, and the scar is small and laterally situated.

In cases of contracture of the neck of the bladder, Martin says (*Therapeutic Gazette,* July, 1907) that excellent results may be obtained by introducing a dilating instrument of sufficient calibre to stretch the neck to 80 or 90 of the French scale. Stretching up to 40 or 50 is practically unavailing, nor is it safe to apply even this degree of distention to the compressor urethral muscle.

From the observation of a large number of prostatectomies, according to Ball (*The Practitioner,* March, 1907), it has been generally accepted that the important muscle to avoid damaging, in doing prostatectomy, is the compressor urethra muscle, and that if incontinence is to be certainly avoided, the membraneous urethra should be carefully avoided. Ball says that it seems quite incorrect to argue from operations upon patients with enlarged prostates that the chief sphincter of the bladder normally lies in the membranous urethra, for, in order to ascertain the part played by the internal sphincter of the bladder in controlling urination, he, in experiments upon dogs, has found that if the urethra is cut off in front of the internal sphincter of the bladder, leaving nothing but this sphincter, the dog has control of urination.

In congestion of the enlarged prostate, Bolton (*Lancet,* April 13, 1907) considers that electrical applications meet the indications of relieving local stasis, restoring the circulation and improving the tone of the muscle fibres of the bladder. In electricity we have a certain relief for all cases,

except in those in which a malignant or tubercular process is present, or in cases in which there is fluctuation from the presence of pus. In the early stages of the affection, a complete cure is uniform.

According to Chute (*Amer. Jour. of Urol.*, March, 1907), many of the so-called "essential renal hematurias" are due to chronic nephritis. In some cases the hemorrhage is slight; in others it produces great debility by its long duration, or even threatens life by its profuseness. It is important to recognize the hematuria of chronic nephritis, as the condition may be confused with a most serious renal lesion and a kidney be unnecessarily sacrificed.

Young (*Jour. Am. Med. Assn.*, May, 1907) reports a case of persistent hematuria, of renal origin, which was cured by the injection of adrenalin into the pelvis of the kidney, through a ureter catheter. He says that by the use of adrenalin to stop hemorrhage we have a measure of considerable diagnostic and therapeutic value. If we can in this way cure cases of persistent hematuria without definite renal lesion, much will be gained, and patients saved from the ordeal of cutting operations. If only a temporary cessation of the hematuria can be procured in other cases, a chance will be afforded for more careful study of the urine and a comparison of the function of the kidneys, which may make renal diagnosis much more easy.

In a case of sudden collapse and death, during a severe but supposedly not dangerous enteritis, Munson (*Jour. Am. Med. Assn.*, July 6, 1907) found at the autopsy that both suprarenals were completely hemorrhagic, and the other organs showed marked congestion. From this, he is led to believe that death was due to circulatory failure, caused by the sudden removal of the tonus producing secretion of the suprarenal glands.

Watson (*Ann. of Surg.*, Sept., 1907) proposes the performance of bilateral nephrostomy, tying off both ureters at the same time, and establishing permanent renal fistulæ, thus diverting the entrance of all urine into the bladder, as a palliative measure in cases of vesical tuberculosis originating in descending infection in which both kidneys are involved, and when the tuberculous lesions of the bladder are causing suffering, and as a preliminary step to the total extirpation of the bladder in cases of vesical tumor. He has devised a suitable apparatus to be used for collecting the urine in these cases.

Griffon suggests (*Ann. des Mal. des Org. Urin.*, Feb. 15, 1907) that as the need of a very early diagnosis of urethral gonorrhea is self-evident, culture methods should be employed. This gives the diagnosis before the purulent stage of the discharge.

It is observed by Osler (*Lancet*, May 25, 1907) that not infrequently the diagnosis of an obscure affection of the abdomen is determined by an examination of the testicles. The nature of a peritonitis or of an abdominal tumor has been cleared up by finding a tuberculous orchitis, or in syphilis gummata may occur at the same time in the liver and in the testicles. But it is more particularly in malignant disease of these organs that abdominal features are met with. In the abdominal tumor there are two groups of cases: First the tumor is a secondary involvement of the lymph glands, and in the other the tumor is the primary involvement

of the retained testis in a monorchid or a cryptorchid. The lymphatics of the testicles discharge very high up into the aortic lumbar glands. The secondary tumor is, therefore, above the level of the navel, and usually begins in the upper quadrant of the abdomen, on the side of the affected organ. It has all the characteristics of a deep-seated mass, which has sprung from the retro-peritoneal glands. The solidity of its growth, its depth, the immobility, the absence of an outline, conforming to the well-known shape of a renal or splenic tumor, and the impossibility of grasping it bimanually, which can be done in the majority of all new growths of the kidney, and the character of the throbbing impulse, which is so marked in these deep-seated lymphatic tumors in the neighborhood of the aorta—all these points favor the view of a large secondary mass involving the lymph glands, connected with the left testicle.

Bucknall (*Lancet*, Sept. 28, 1907) proposes the following operation for penile hypospadias: The penis is drawn well up over the pubis and an incision is made on each side of the median line, one-eighth of an inch from and parallel to it, beginning on the glans and extending down on the under surface of the penis and on to the scrotum until the incisions on the scrotum, measured from the misplaced meatus, are equal in length to those on the penis, measured from the same point to their commencement on the glans. From the extremities of the two incisions, others are made outward at right angles, each a quarter of an inch in length. These flaps are dissected up off the side of the penis and scrotum, respectively, and rolled outwards from the median line throughout their whole length. The flaps are held in the everted position and the penis flexed down on to the scrotum in the middle line about a transverse axis, passing through the misplaced meatus. The median strip of skin on the ventral aspect of the penis, and the raw areas flanking it, thus come to lie on the corresponding median strip and raw surfaces on the front of the scrotum. The penile strip of skin will form a roof for the new urethra, and the scrotal strip will form its floor. The raw surfaces on each side, when properly sutured, will grow together, fixing the penis to the scrotum, and closing in the lateral walls of the new urethral tube, so as to render it water tight. In suturing the flaps, the sutures are placed transversely and drawn taut over a small piece of rubber tubing, placed on either side to prevent puckering. In passing the needle on the inner side of the flaps, care must be taken not to enter the new urethra, but still be close enough to exactly approximate its edges so as to prevent leakage. A small rubber catheter, with the eye cut off, is passed along the new urethra and pushed a short way down through the old meatus, so as to drain off the urine without soiling the new portion. The piece of catheter is removed on the fourth day, and the sutures on the fourteenth day, when the second operation may be performed, or postponed indefinitely, as desired. The second operation consists in dissecting up the penis and new urethra from the scrotum, lateral flaps derived from the scrotum being left on either side of the penis to close in the surface beneath it. Other flaps are formed on the scrotum, by means of which the raw surface there is closed. If the lateral flanges used to unite the penis and scrotum project too freely, they can be trimmed off to improve the cosmetic result.

# OTOLOGY AND LARYNGOLOGY.

By W. E. Sauer, M. D.

The literature of the past year gives ample evidence of the enormous amount of work done in these specialties. The contributions to the laryngological and otological literature are so numerous, that in the few pages allotted to these subjects the reviewer will be able to mention only the most important points that have come to his notice, especially those relating to diagnosis and treatment.

Considerable interest has manifested itself on the value of the x ray in the diagnosis of sinus diseases. Goldman and Killian[1] have reported the results of their work. They have found that the Roentgen pictures are of especial value when taken in the saggital diameter of the skull, giving information of the topographic anatomic relations of the accessory cavities and their diseases. According to their views, it should be classed with the other methods of examination. A résumé of their observations furnishes evidence of the diagnostic value. These plates show cases of frontal sinus, ethmoid and antrum suppuration, diseases of all the sinuses combined, and cases of absence of the frontal sinus. In the reproductions of the exposures one mainly recognizes in an instructive manner the different relations of the frontal sinus with its orbital, temporal and frontal prolongations, which are at times separated from the main cavity by partitions. Wassermann[2] is also a very enthusiastic advocate of the x ray. He has never been led astray in the interpretation of a Roentgen plate, and he has frequently corroborated the findings of the x ray by operative opening of the sinuses. He lays special stress on the value of the x-ray plate in the diagnosis of diseased ethmoid cells. Langworthy[3] believes that the x ray has done as much for the advancement of surgical rhinology as almost any hitherto single discovery in the domain of medicine and surgery. Beck[4] also expresses himself as favoring the x ray as a diagnostic agent, and concludes as follows: 1. That the real value of a skiagraph for diagnosis of sinus disease is in taking an antero-posterior exposure. 2. That the skiagraphs taken in the transverse view are of but very little value for diagnostic purposes, owing to the fact that one side is superimposed upon the other, but it will give an outline of the sphenoidal as well as the anterior group of cells as to their shape and size. 3. That the angle at which the tube is placed is of the greatest value, taking particular care that the rays do not have to penetrate through the massive part of the base of the skull. A transverse line seen across the orbit is found if the angle at which the plate was taken is correct, and this line is found about a half an inch below the supraorbital margin. 4. Dangerous conditions, as burns, alopecia, are possible only if one has no knowledge of the technic, or from carelessness. However, do not expose your patient to repeated long exposures within a brief period of time.

There is still considerable discussion as to the best method of treatment in the chronic affections of the maxillary sinus. The majority of operators prefer the intranasal methods of opening the sinus, though there are some who still believe there are a number of cases than can be cured by irrigations through an opening made in the alveolar process. The indications for and the advantages of the intranasal route are given by Myles[5] and Abraham.[6] Black[7] and Moore[8] make a plea for conservatism in the treatment of these cases. Vail[9] has described a curved saw with which an opening is easily made into the antrum through the nose. Curtis[10] has devised a special chisel for opening the antrum through the nasal-antral wall. Denker[11] reports the results of his radical operations on the antrum in 18 cases (the technic was described in the review of 1906). The cases were all chronic cases in which the usual methods had failed. The cases all recovered in less than 30 days; in one case a cure was obtained in 6 days. There were no ill effects following the removal of the antral nasal wall in any of the cases. Good[12] describes a new method of opening the frontal sinus intranasally; after cocainizing, a protector is inserted into the sinus and a part of the processus frontalis of the superior maxillary bone, as well as a part of the spina frontalis of the frontal bone, and the anterior wall of the ethmoidal labyrinth are chiseled through and removed with forceps or a curette. The anterior ethmoid cells are removed with a curette, a frontal sinus rasp is introduced and the spina frontalis is rasped out, as well as the frontal accessory ethmoid cells, if present. The sinus is then curetted with flexible curettes and diseased membrane removed. Good believes there is absolutely no danger to the intracranial structures. The most that could happen would be to rasp through the orbital wall, but this is avoided by an assistant putting his finger into the orbit. Halle[13] has also described a new method for opening the frontal sinus intranasally. He introduces a protector into the sinus and then enlarges the opening with a special drill, which he has devised. He has demonstrated this operation on numerous specimens, and clinically in ten cases, twice in one of the cases; making 12 in all.

The relation of the diseases of the nasal accessory sinuses to diseases of the eye have been discussed by Brawley[14] and Griffin.[15] The latter states that it is only in recent years that the ophthalmologist and the rhinologist recognize the fact that many occular symptoms are frequently produced by inflammatory conditions in the sinuses. Not only may the symptoms of refractive defects, muscular imbalances, conjunctivitis, glaucoma, etc., be simulated, but active destructive lesions such as neuritis, choroiditis, iritis and keratitis may result from an infective process in adjacent ethmoiditis or sinusitis. He does not regard an ocular examination complete which does not include an inspection of the nose and its accessory sinuses. Brawley states that, as a rule, no history of nasal disease is obtainable, and the patient will frequently object to a nasal examination. Mayer[16] reports a case of blindness of nasal origin. The case was that of a woman who had suffered for years from empyema of the accessory sinuses, and who, after an attack of acute

coryza, suddenly became blind in one eye, with a considerable reduction of vision in the other eye. The sinuses were freely opened and irrigated, and the vision in the partially affected eye was restored to almost normal, but no change in the blind eye. Mayer urges that the accessory sinuses should be carefully examined in all cases of retrobulbar neuritis.

In the treatment of intumescent and hypertrophic rhinitis, Ingals[17] still mantains that the galvano-cautery, properly applied, is the treatment par excellence, and that cures can be effected in more than 95 per cent of the cases. Neres[18] claims the following advantages for voltaic turbinal punctures, by means of the negative pole, in the reduction of turbinal hypertrophies: 1. Pain is practically nil. 2. Bloodless operation. 3. No scar tissue remains on the surface. 4. The mucous membrane after treatment performs its natural function. 5. No post-operative complications follow. Kuyk[19] reduces turbinal hypertrophies by making one or more incisions through the mucous membrane well down to the bone, when with a broad nasal saw the bone is cut into, to a depth depending on the consistency and hypertrophy. After an experience extending through a period of six years, he has found this method very satisfactory. Yankauer[20] has devised a new method of operating on the turbinate. His procedure consists of making two parallel incisions above and below the hypertrophied portion of the turbinate. The hypertrophied portion of the mucous membrane is then dissected from the bone, and a portion of the bone is removed with suitable forceps. The edges of the mucous membrane are then brought together and stitched over the wound. Union by first intention takes place, leaving a minimum amount of scar tissue. Yankauer has devised a number of ingenious instruments, but it is doubtful whether the method will ever become popular, owing to the time required to complete the operation. Moraweck and Hall[21] advocate the complete removal of the inferior turbinate. They claim that dryness of the throat and increased tendency to infection of the lower respiratory tract, as claimed by some, does not follow, and that these claims are not founded on facts. They have never seen any ill effects in any of their cases, and claim to have operated on more than 100. Cortez[22] reports a typical columnar celled epithelioma of the inferior turbinate in a woman aged 38. The special points of interest are, first, the age of the patient; second, the rarity of primary cancer of the nose, especially the inferior turbinate.

Caselbery[23] gives the following indication for the removal of the middle turbinate: 1. To promote drainage and counterdrainage in nasal accessory sinus suppuration and access in diagnosis and treatment. 2. To promote drainage and cleansing in certain types of atrophic rhinitis. 3. To relieve edematous turgescence and to provide for the radical treatment of non-suppurative ethmoiditis and nasal polypus. 4. To suspend pressure leading to headache, neuralgia, eye symptoms and broadening of the nasal bridge. 5. To improve nasal respiration and ventilation. 6. To relieve hyperesthesia and to diminish certain re-

flexes, sneezing, asthma, etc. The technic of removal has been discussed by Richards,[24] which is the more commonly employed method of "punch forceps and snare." Sluder[25] employs a modification of Hajeck's hook for making the initial cut. The hook is especially indicated when the nasal passages are very narrow. Stucky[26] lays special stress on the non-operative treatment of the middle turbinate. He is of the opinion that the average case of disease or irritation of the middle turbinate does not require surgical treatment, the cases being mostly systemic. The exciting factor in precipitating an acute attack is not so frequently due to exposure to cold as to overindulgence or injudicious eating and drinking, and urinalysis will show an excess of indican and uric acid. The treatment consists of elimination and correcting the faulty intestinal metabolism, restoring bodily resistance, and in cleansing, soothing and protecting the irritated area.

Though there has been much work done on atrophic rhinitis, we must agree with Fraenkel[27] that much more will have to be done before our knowledge is mature and certain. Beck[28] brings out the value of radiograms in estimating the involvement of the sinuses in this disease, as well as the consistency of the bony structures of the turbinates and other bones of the face. He is not absolutely certain, however, that the skiagraph is true in every instance, but he believes it to be in the majority of the cases. Of the 24 cases of atrophic rhinitis that he radiographed, the sinuses were found to be involved in all but three cases, but they were of a light type of atrophy. He employed the various methods of treatment, and sums up his findings in the following conclusions: 1. The sinuses are very frequently involved in atrophic rhinitis, whether primarily or secondarily it is not always possible to determine. 2. That when the sinuses are involved the atrophy must have some other cause, as for instance bacteria, heredity, etc., for we find many sinus troubles with hypertrophy. 3. That radiographs are an aid in diagnosis, and should be practiced by every rhinologist. 4. That treatment direct to the sinuses is followed by improvement much more readily than when they are not treated. 5. That surgical intervention, preferably intranasal, give the best results. 6. That the results of local treatment, as tamponing, massage and electricity, vapor, therapy, paraffin injections, Bier's treatment, etc., are brought about by the production of hyperemia and leucocytosis, bringing about an alternating condition and possibly a resolution or restitution of glandular structures, normal mucous membrane, and even some of the erectile tissue. Sondermann[29] recommends the use of a rubber condon for the tampon treatment of atrophic rhinitis. The condon is introduced collapsed, then it is inflated until it fits close against the wall of the nose, filling all the crevices, and after five or ten minutes the air is allowed to escape and the condon is removed, many of the crusts adhering to it, while those remaining in the nose can be expelled spontaneously.

The literature on the septum has not been nearly so extensive as in the past. Moscher[30] offers a new theory as an etiologic factor in the deformities of the septum. He believes that the delayed eruption of the

lateral incisors causes a misplacement of the premaxillary wings, and hence a deflection of the septum. Regarding the treatment of septal deformities, it must be admitted by its opponents that the submucous resection operation has received general favor, and has been accepted by the majority, as the operation of choice. The technic of this operation was considerably improved upon during 1906, but nothing of special advantage has been added during the past year. Coffin[31] considers the most objectionable feature of the resection method to be the length of time required to perform it, and the strain on the patient and the operator. He claims to have overcome both objections in a new operation which he performs in two sittings. At the first sitting a more or less perpendicular incision is made anterior to the deviation, and the mucoperiosteum is raised as far as the edges of the deviation. The space then made is injected with sterilized vaseline and allowed to heal one week; at the end of that time a similar incision is made on the other side, a little anterior to the first incision. The perichondrium is elevated and the deviations removed with a blunt knife. A pledget of antiseptic cotton is introduced into the nostril, and is then pulled forward to hold the septum in the median line, and the wound is allowed to heal. Jackson[32] describes an operation for closing small perforations of the septum, by means of a large, round flap taken from the mucosa and submucosa of the inferior turbinate. The flap is raised and after freshening the edges of the perforation, it is stitched in place. If the perforation is large, it may be necessary to take a flap from the opposite turbinate. Haseltine[33] has also described a method of closing septal perforations. The edges are carefully pared, and a V-shaped section is removed above and below. A vertical incision is then made on the septal mobile, and a flap is lifted backward to and entirely around the perforation. The muco-perichondrium of the opposite side is elevated entirely around the perforation, and the bone or cartilage of its immediate border is removed; a vertical incision is made far enough behind the aperature to produce a flap wider than the anterior posterior diameter of the perforation. This flap is brought forward and sutured to the anterior margin on the same side; the proximal flap is slid backward to meet the posterior margin, if possible, but not far enough to uncover the juncture of opposite membrane. The flaps are held in position by the Bernays-Simpson tampon.

The question as to the etiology of nasal polypus is still somewhat clouded. Yonge[34] thinks that the formation of polypi is the result of a chronic inflammation which is followed by dilatation of the glands and gland ducts; then edematous infiltration of the surrounding tissue, due to an increased permeability of the capillary walls; then by the formation of folds or projections in the infiltrated mucous membrane; then an increased edema in certain of these folds. The result is the formation of a flat edematous projection, known as the nasal polypus. Williams[35] is of the opinion that nasal polypus is produced by the obstruction of the lymphatics; that the occurrence of localized edema was due to an infective lymphangitis, the lymphatics becoming obstructed, and not the arteries or veins directly. Abrahams[36] reports a case of cystic degeneration

of a nasal polypus. The polyp removed was found to contain a cyst lined with ciliated columnar epithelium. Harmer[37] regards the question of the transformation of the polyp into cancer as possible, but not probable.

The subject of hay fever has not received as much attention as during the past two years, when the Dunbar serum treatment was claiming the attention of medical men generally. During the past year very little was heard of the Dunbar treatment. Curtis[38] reviews the recent theories on etiology and treatment of hay fever, and arrives at the following conclusions: 1. Hay fever is a disorder amenable to no specific treatment. 2. The number of cases of hyperesthetic rhinitis from other causes than rag weed and other pollens, is about one-third of the total number. 3. About one-third of the cases supposed to be due to pollen reaction may be relieved by constitutional and surgical methods of treatment. Predisposition to attack in these cases being due to definite causes, would suggest the theory that induced enervation of the sympathetic was an important etiologic factor. 4. Primary intoxications may take place from pollen toxins in cases where the sympathetic systemic apparently is not previously enervated; these cases theoretically should react to antitoxin treatment. 5. The consensus of opinion today is against the claims made for pollantin, though observers who have been instructed personally by Prof. Dunbar indorse unqualifiedly the great benefit to be derived from the treatment. 6. Medically, the suprarenalin capsule products hold the first place today in the treatment of hyperesthetic rhinitis. 7. The importance of constitutional treatment as an adjunct to any local application is of supreme importance. 8. The best of all treatments yet found is the climatic, with previous attention to nasal conditions. Braden Kyle[39] reports his recent experience in the study of the chemistry of the saliva in relation to hay fever. He states positively that in at least 60 per cent of the cases he has been able to demonstrate that the local irritation is primarily due to an altered chemistry and to altered resistance. He has succeeded in relieving these cases by changing the reaction of the saliva from acid to alkaline and from alkaline to acid; by such drugs as citrate of soda, benzoate of soda, hydrochloric acid and dilute nitric acid; in that way nearly 60 per cent of his cases were relieved without any local treatment whatever, either by local or systemic remedies. Schadle[40] still holds to the theory of Fink, of Hamburg, that catarrhal sinusitis of the antrum of Highmore is an important etiologic factor in the causation of hay fever. He has treated 91 cases by washing out and medicating the antrum, and has obtained a cure in nearly every one of them. Killian[41] believes that the hypersenitiveness of the nasal mucosa in hay fever and vasomotor remedies is confined to four principal points; these spots are found on the septum in the region of the tubercle, and on the lateral wall just in front and above the anterior end of the middle turbinate, that is, in the region of the ethmoidal nerves. The treatment is two-fold: 1. Local treatment, which consists in the removal of causes which excite hyperesthesia of the mucosa and elimination of reflexes. 2. General treatment when the nervous system is to be considered. The

elimination of the reflex is best accomplished by cauterizing the four sensitive areas with trichloracetic acid, after cocainization. On each of these four areas, a cauterized surface of less than one-half inch in diameter suffices. The result is sometimes permanent, but even when only temporary, it may extend over an entire hay-fever season. Mechanical obstruction of the nose must be relieved. Pereira[42] maintains that hay fever is a hyperemia of the conjunctiva, and that the other symptoms are mostly secondary. He associated hay fever with pterygium, and claims that sufferers from hay fever are invariably great sufferers from pterygium.

Smith,[43] in observing 300 cases of asthma, has found that the origin lies in the nasal fossæ; the asthma being due to pressure on the asthmatogenous points in these cavities, this acting on the pneumogastric nerve, and explains the various phenomena of true asthma. This pressure irritation may be on the septum, and there may be no occlusion of the nares; it may be due to a closed empyema of the ethmoid cells, or sinusitis. In every case of true asthma, the relief of pressure in these areas will give almost instant relief to the spasm, and the relief may be made permanent by such treatment as will prevent pressure. Sullzer[44] advises the administration of atropine hypodermatically, for the relief of asthmatic attacks; a dose of one mg. causes a marked improvement in the subjective conditions.

Developmental defects, such as hair lip and cleft palate, had formerly been left to the care of the general surgeon, but during the last few years rhinologists have taken them up with considerable interest, as shown by the case reports. Brophy[45] describes the anatomy of the palate, both normal and cleft, and gives the following as causes of cleft palate: 1. Hereditary. 2. Mechanical force exerted by the lower jaw against the upper jaw in embyro. The defect is due to failure of union. He states that the bony cleft should be closed within three months after birth, when the bones are soft and easily moved in the correct position. The hard palate should be closed before the lip operation, which should follow in three months, and the soft palate should be operated on last, preferably when the patient is from 14 to 16 months old. Starr[46] reports that many operations for cleft palate are failures from breaking down of the line of closure, which is due to the sucking of the stitches by the patient, or infection from the mouth. In order to avoid this, the author employs a thin plate of aluminum to protect the line of closure; and to prevent infection, the mouth is sprayed with a solution of boric acid and 10 per cent rectified spirits. According to Makuen[47] an operation for the closure of a cleft palate should be done only when there is a chance of success. It should be done only by those possessing special skill in nasal, pharyngeal and aural surgery. When it is probable that several operations are necessary, the parents of patients should be so informed. In the difficult adolescent cases, a preliminary tracheotomy may be necessary. The palate should be closed to improve the health and improve the faulty speech. The general health of the patient is benefited by improving the hygiene of the naso-pharynx and aural cavity. The

speech is improved by a course of psycho-physical training, in which the patient is taught first to recognize normal speech and then to make the best use of his still imperfect organ and its production.

The literature on adenoids has been very abundant, but very little of importance has been brought out. Morse[48] points out their frequency and importance in infancy. He claims that often a small amount of adenoid tissue may cause a marked amount of obstruction, with the resulting phenomena of nasal obstruction in an infant. The removal of these adenoids he considers a simple matter. White[49] examined 75 adenoids histologically, and found that primary tuberculosis was present in 5 per cent of all the cases. He claims that tuberculosis is not an important factor in the etiology of adenoid hypertrophy, but adenoids and tonsils are considered important channels of infection in tuberculosis of the cervical glands. The question of anesthesia in the removal of adenoids seems to be a fairly settled one. When an anesthetic becomes necessary, ether is the anesthetic. Chloroform has proven to be a very dangerous anesthetic in these cases. Yearsly[50] greatly deprecates unskilled operations, and strikes the key note when he states that recurrence of the growth is but too often another term for improper removal. Wochenheim[51] reports two cases of secondary hemorrhage following the removal of adenoids. The hemorrhage occurred five days after the operation. Both operations were performed upon children 9 years of age. The curette was used in the one case, and the forceps in the other. He found adrenalin of no value in controlling the hemorrhage, but found vinegar applied through the nose to be very effective. Iglaur[52] has hit upon a plan by which most of the bleeding can be avoided during adenoid operations. He ties a piece of rubber sponge to the end of a string which has been passed through the nose, just as in applying the post-nasal tampon, and immediately after the adenoids are removed this tampon is placed in the naso-pharynx and allowed to remain 5 to 10 minutes, when it is removed. In this way the author has succeeded in performing the operation with a minimum loss of blood.

Considerable work has been done with reference to the relation of the tonsils and lymphoid structures in the pharynx to systemic infections. Goodale[53] is of the opinion that the tonsils alone are not the only points of entrance, but that the lymphoid follicles of the posterior pharyngeal wall and of the pillars are responsible in many cases. He reports in detail a case of rheumatism in which the tonsils had been removed, but there was recurrence of the rheumatism with acute sore throat. Treatment directed to the throat was followed by rapid improvement of the joint symptoms. There is a marked tendency to the more radical removal of the diseased tonsillar tissue. From the discussion of this subject by the members of the American Laryngo-Rhinological Society at its annual meeting, it would seem that the tonsillitome will soon be relegated to the scrap pile. Among the authors making strong pleas for the radical removal of the tonsils we find Moroweck and Hall,[54] Gallagher,[55] Griffin[56] and MacLaren.[57] Wright[58] has noticed for many

years in the macroscopic sections of lymphoid tissue removed from the naso- and oro-pharynx which he formerly regarded as ectesia of the lymph channels, and reported them as cysts of the lymphoid tissue. A recent observation has led him to believe that some, at least, of these spaces in the lymphoid tissue are due to a fatty degeneration, and that this is one of the processes of tonsillar regression. Lind[59] has found latent tuberculosis in 5 out of 50 cases of enlarged tonsils. In only one case could a tubercular lesion be demonstrated elsewhere. Robertson found that 8 per cent of patients presenting themselves for nose and throat treatment had primary tuberculosis of the faucial tonsils; also that a large number exhibited lung tuberculosis as a direct infection from the glands of the lymphatic chains.

The fossa of Rosenmueller as an etiologic factor in middle-ear diseases is pointed out by Bryant.[60] He has made a number of investigations and concludes as follows: Rosenmueller's fossa is frequently the seat of masses of lymphoid tissue, as well as bands of adhesions, which greatly interfere with the movement of the cartilage of the tube. These pathological structures can be seen best with the salpingoscope. The removal of these abnormalities is frequently a very effective treatment in middle-ear conditions. Emerson[61] also lays great stress on the value of the removal of bands of lymphoid tissue in Rosenmueller's fossa, and reports a number of cases in which marked benefit followed this procedure.

Another case of primary laryngeal tuberculosis is added to the literature by Manassa.[62] Chiari and Schech have been able to find only 4 cases of primary tuberculosis of the larynx based on autopsy. In the case reported by Manassa, a subglotic swelling could be seen which occluded the lumen of the trachea. Marked dyspnœa occurred, and a tracheotomy was performed; the patient died suddenly one week later. There was a circumscribed tubercular process of the right vocal cord, with perichondritis of the cricoarytenoid articulation. No tubercular lesions were found in any other part of the body. Bardwell and Adams[63] report six cases of well marked tuberculosis of the larynx, having ulceration in addition to the congestion, in which complete vocal rest was followed by great benefit. In the four ulcerative cases the ulcers were cicatrized; in five cases the normal voice was restored, and the general health was improved. Jurasz[64] states that prophylaxis is of great importance, and that it is essential to place the larynx at rest. The diet should be regulated with reference to its consistency. The use of astringents and the curette should be avoided if the disease is widespread. Semon states that the rest cure, in order to be of any value, must be faithfully carried out, and this, he states, is oftentimes extremely difficult. Importance of the early attacks of malignancy of the larynx is emphasized by Stein.[65] He states that every case of chronic hoarseness, especially if unaccompanied by a cough, should be regarded as suspicious, and carefully watched, on account of the frequency of hoarseness as a symptom of many laryngeal diseases; its significance is liable to be disregarded until too late to save the patient's life. In any case in which

a chronic hoarseness, for which no definite cause can be determined, should be repeatedly examined. Stein considers the external method of operation as being the preferable one, stating that it is impossible to remove all the diseased tissue by the internal method. Semon[66] also advises early diagnosis when thyrotomy will suffice to save the patient, in cases of intrinsic cancer. Total laryngectomy will remain the operation of choice in cases of intrinsic cancer of the larynx. According to Sendziak[67] the proportion of cases is found to be constantly increasing, while the mortality is constantly decreasing. The mortality with thyrotomy was far the lowest, only 3.5 per cent. Cohen[68] states that the modern procedures in excision of intrinsic malignant growths of the larynx virtually exclude all endolaryngeal methods. The author prefers his own method in doing a thyrotomy. He begins by doing an ordinary tracheotomy, excising the skin only so far as to uncover the larynx, leaving intact a broad bridge of skin above the cannula. This considerably lessens the dimension of the external wound, and favors the reunion in the sequence. Baumgarten[69] states that in his experience with multiple papillomas in adults, the larynx was always as soft and transparent as a child's larynx, and the patients were all blondes. He states that in time the tendency to papilloma formation ceases, generally with puberity, but also after a time in adults. He never applies local caustics and has never noticed any benefit from iodine or arsenic internally, but extols the lori operation as easy, simple and humane.

The employment of the tracheoscope, bronchoscope and esophagoscope as a means of diagnosis and treatment has rapidly gained favor with the majority of laryngologists. Prof. Killian's visit to this country last June, when he demonstrated his methods in numerous clinics in the United States, has done much towards the general employment of these instruments. In a paper read before the American Rhino-Laryngo-Otological Society, in which Killian takes up the treatment of foreign bodies in the respiratory tract and the esophagus, he classifies the various bodies into two great classes, the hard and the soft. These are again divided according to their shape. He lays down special rules in each instance; he also reviews the results of tracheo-bronchoscopy. So far 164 cases have been reported, with 117 successful removals of foreign bodies from the trachea and bronchi. Killian had only one death in 20 cases, and this occurred six months later from a severe lung complication. In only two cases was he unable to find the foreign body. Esophagoscopy was performed in all cases where the patients were thought to have swallowed a foreign body. He considers this method most satisfactory from a diagnostic and therapeutic standpoint. The literature is rich in case reports, as well as improvements in the instrumentarium. Among the latter we find marked improvement made by Bruennings[70] in his modification of the Killian instruments. Jackson, of Pittsburg, has written a book on tracheo-bronchoscopy, esophagoscopy and gastroscopy. He has succeeded in removing a foreign body from the stomach, by means of his gastroscope. He also reports a case in which he made direct applications to a gastric ulcer. Stark[71] discusses the esophagoscopic

diagnosis of the diseases of the upper part of the esophagus. He quotes Mickulicz as stating that esophagoscopy is possible in only three-fourths of all adults. Stark is convinced that it is possible to safely employ the esophagoscope in every normal child, as well as in every normal adult. He reviews the various diseases of the esophagus, and states that the more closely the esophagus is examined, the less often will the diagnosis of esophageal neurosis be made. He claims never to have failed in removing a foreign body by means of the esophagoscope. He considers the esophagoscope a dangerous instrument only in the hands of the inexperienced.

The clinical value of the differential blood count in operative otology is discussed by McKernon.[72] He bases his observations on a study of 166 cases, of whom 108 were adults. He concludes that in septic cases, and particularly when distinct symptoms and physical signs are absent, the differential count is of practical value in enabling us to complete a diagnosis, and in cases of sepsis, when the physical signs are distinct and definite. It is then only confirmatory and gives an added link to the chain of evidence. In doubtful cases, when a differential count is taken and found to be negative, other daily counts should be made. Another fact of importance is, that when cellular bone structures like the mastoid are involved in a septic inflammation, without involvement of the adjacent blood currents, we find that the majority of blood counts show a relatively lower polynuclear percentage than when the soft tissues are involved. The absorption of toxins is less rapid than when the soft tissues are involved. In a number of cases operated upon, an abundance of pus was found when the count showed a polynuclear percentage below 72 to 80. Brandegee[73] reports a case of acute brain abscess and a case of acute double mastoiditis, in which six blood counts were made in the one, and five in the other. In the one case, the relative increase in the polynuclear percentage was confirmatory of a new pus formation, as proven by the operation. In the second case, there was at first an increase in the polynuclear percentage, but not high enough to warrant surgical interference. The clinical symptoms grew in severity and preparations had been made for operation. The blood count then showed a decrease of the polynuclear percentage from 77 to 65.9 per cent; on the strength of this the operation was then postponed. The patient made an uneventful recovery. These cases most strikingly illustrated the value of the blood count.

Krishi[74] believes there is such a thing as an otitic dyspepsia. He reports several cases of purulent otitis media in infants, in whom the disease was associated with digestive disturbances, flatulence, diarrhea and emaciation which ceased when the ear disease was cured. In these cases there was no reddening of the tympanic membrane. He attributes the diarrhea to the passage of the pus into the alimentary canal by way of the Eustachian tubes.

A case of acute otitis media treated by the opsonic index method is reported by Magruder and Webb,[75] in which the microscopic examination of the pus showed almost pure cultures of pneumococci. The pa-

tient had resisted all forms of treatment for 61 days. Cultures were then taken in serum broth and plain agar. An excellent growth appeared with each. The patient's opsonic index to this growth was found to be 0.7. A vaccine was grown and standardized, according to Wright's method, and an inoculation of 14 millions was made. An increase in the aural discharge was noted for the first 24 hours; for the two days following he had intense headache. Two days later there was only a trace of the discharge; the opsonic index on that day was 1.1. Two days later no trace of the discharge was seen; ten months later there had been no recurrence of the trouble. Webb also reports that several other cases had responded to the same method of treatment. Hamilton[76] finds that in cases of otitis media in which pseudo-diphtheria bacilli predominate in the pus, there is usually a low opsonic index for these bacilli. Injection of dead cultures of the strain isolated from the patient, results in an increase of the opsonin for that strain. No ill effects appear to follow injections of moderate quantities, and in several cases apparent improvement and shortening of the course resulted; but further experience, especially in chronic cases, is necessary before a definite impression can be formed as to the value of the treatment.

The value of Bier's treatment in the treatment of middle-ear suppuration, as proven by the experiments made in Schwartz's clinic, is recorded by Froese.[77] He states that in the application of the Bier treatment in mastoid cases, the great obstacle met with is, that the blood vessels lie in bony canals and are not capable of distention. The principal domain for the Bier treatment in otology would naturally be, the simple uncomplicated cases of otitis media and the subacute mastoid cases in which a periostitis is present. Chronic cases without caries and cholesteatoma were beneficially influenced, but it must be carried out in conjunction with other treatment. Tubercular mastoid cases were not cured by this treatment. The staphylococcus infection seems to be the most benefited by this treatment.

The significance of optic neuritis in thrombosis of the cranial sinuses and internal jugular vein is discussed by Langworthy.[78] He found that in 26 cases of thrombosis of the cranial sinuses, and the internal jugular vein, only 30 per cent showed any involvement of the optic nerve. In nearly three-fourths of the cases the diagnosis had been made without any demonstrable lesions. An ordinary marked papillitis is followed by post-neuritic atrophy; but in the optic neuritis met with in thrombosis of the lateral sinus and the internal jugular vein, the reverse seems to hold good. Almost without exception, the neuritis subsides and the disc regains its normal appearance with excellent vision. He considers that when optic neuritis does occur, it is of the highest importance. Barr and Rowan,[79] in investigating the frequency and significance of optic neuritis and other changes in the retinæ of patients suffering from purulent disease of the middle ear, found that vascular changes are far from uncommon. In 6 out of 100 cases there was optic neuritis, and in 21 there were vascular changes, but short of neuritis. The ear affections associated with these vascular changes in the eye were especially severe

and persistent, as shown by their course. The presence of these vascular changes, therefore, in the optic discs, would seem to give an unfavorable character to the prognosis of middle-ear diseases, that is, it is a danger signal not to be ignored. The practical lessons are: 1. That a case showing these changes in the fundus and their existence should be regarded as an additional reason for the early performance of a mastoid operation. 2. If on the other hand they show a tendency to clear off, especially with improvement in the ear condition, or if the fundus is normal in the beginning and remains so, we may with more confidence look for a favorable response to conservative treatment.

A new method of producing local anesthesia for intratympanic operations is described by Ballin.[80] After cleansing the external auditory canal, a small piece of cotton is placed deep into the canal to protect the drum. A cleft speculum is then introduced so that only the superior wall of the canal is exposed to view. With the aid of an assistant, a spray of ethyl chloride is allowed to play on the exposed surface, and as soon as the parts are well anesthetized the needle of the syringe is quickly introduced at the junction of the bony and cartilaginous canal, and the fluid is slowly injected. The author uses 10 to 15 minims of a 1 per cent solution of cocaine, to which 5 to 6 minims of adrenalin have been added. The injection must be carried out slowly so that the infiltration takes place gradually, thus avoiding any unnecessary pain. In from 5 to 10 minutes the drum is perfectly anesthetized and a paracentesis can be performed without any annoyance to the patient. This operation takes about 10 minutes, and can be employed in all adults.

Ossiculectomy in middle-ear suppuration is, according to Love,[81] not often a wise procedure. When an operation is necessary at all, the mastoid operation is that of choice. When the mastoid operation is not necessary, a careful cleaning of the ear will usually procure cessation of the discharge. Ossiculectomy is only useful in a small number of cases in which the disease seems limited to the ossicles, and it is better than nothing when the mastoid operation is refused. He also claims that the period of healing is longer after ossiculectomy than after the radical mastoid operation. Randall and Crockett[82] also speak discouragingly as to the value of ossiculectomy. Randall states that he has yet to see one successful case from that operation.

The indications for the radical mastoid operation, as presented by McKernon[83] before the members of the American Otological Society, 1907, and the discussion which followed show that there is a marked tendency to conservatism, and that considerable attention is being paid to the function of the ear after the operation. Heretofore, the majority of operators have been satisfied with the result when the wound cavity was completely epidermized with a cessation of the discharge, while the hearing was only of secondary importance. The work of Heath, of London, has been a great stimulus, and has done much to more clearly define the indications for the radical mastoid operation. Heath[84] and his followers maintain that in the majority of cases of chronic suppuration of the middle ear, the main seat of the trouble is in the mas-

toid antrum, and if this is eradicated the ossicles may be left in position. In many cases there is a complete cessation of the discharge with healing of the perforated drum membrane, and marked improvement of the hearing. Amberg[85] has collected the reports as regards the time of healing after the radical mastoid operation from some 30 different operators, the average time being 2 months and 26 days. He concluded that only exceptionally a chronic middle-ear suppuration which does not respond to mild treatment without more radical interference, should be allowed to continue. Held and Kopetsky[86] report a case of purulent meningitis following a radical mastoid operation which ended in recovery. The meningeal symptoms appeared two months after the operation. Lumbar puncture revealed pus and a large number of extra cellular diplococci. The eyes showed double choked discs. The dura was incised and the left ventricle was entered. The most marked improvement followed the lumbar puncture. The case slowly improved and ended in recovery.

An unusual interest has been displayed in the suppurative affections of the labyrinth. At the 1907 meeting of the American Laryngo-Rhino-Otological Society a symposium on the purulent affection of the labyrinth consecutive to diseases of the middle ear was presented. The pathology was discussed by Blake,[87] the symptomology and diagnosis by Riek, and the treatment by Richards. The latter has described in detail the various steps in the complete exenteration of the labyrinth. A contribution to the indications for opening the labyrinth is given by Uffenorrde.[88] He quotes Hinsberg's statistics of 67 labyrinth operations, with a mortality of only 3 cases. Matte[89] reports a case of harassing tinnitus in which the opening of the labyrinth was followed by relief which has now stood the test for two and one-half years.

From the foregoing, the statement attributed to Wild, that a knowledge of the internal ear was not essential in the treatment of the diseases of the ear, is no longer tenable; but, on the other hand, a knowledge of the minute anatomy is absolutely necessary.

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# PATHOLOGY AND BACTERIOLOGY.

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The character of the work in pathology during the last year is such that a detailed review of the single additions to our knowledge would consist simply of short abstracts of a great number of single publications, and would not conform with the object of the yearly review of this Journal. The reason why single observations in special pathology and particularly in pathologic anatomy, although important for the whole, cannot be comprised in such a review, is because of the diversity of the subjects they deal with, subjects that, in their general relation to the progress of pathology, are essential, but are merely additions to, or confirmations of knowledge already established. A review this year is more difficult than before on account of the growing consideration of the fact that pathology alone cannot penetrate into the riddles of life without becoming a part of biology and shaping its study according to the general interrelation of all phenomena of life. Pathology is no longer the study of morphologic changes, macroscopical or microscopical. It is the science that begins to embrace in its field all other phases of the problem,—the physical, chemical, physiologic and generally biologic processes occurring in health and disease. An integral part of its study must be the investigation of the functional as well as of the morphotic alterations. It is not explaining when we can recognize the presence of an alteration by definite and typical characters; what we must know is the beginning of it; the causes that lead to it and the influences that bring about the physiologic or morphologic changes. It is not sufficient to call the tubercle bacillus the causative agent of a disease; we must know what general and specific conditions obtain to make it become causative of trouble. It is not an explanation when tumor formation is judged only by pathologic-anatomic material, even if we begin with a very early tumor. It is a fact that as yet the origin of a tumor has never been watched or observed. The biologic investigation must become an important factor in pathologic work. The necessity for this is generally recognized and to it a great part of the pathologic literature of this year is devoted. In trying to do this it was soon noticed that many pathologic problems could not be logically solved without an entire knowledge of the total of the interrelation of the different factors entering into the problem. Pathology can only explain disease when it resorts to acquiring this knowledge. Disease is only a variation from so-called normal conditions, a variation called abnormal or pathologic because it exceeds the variations that are naturally present between each two organisms of the same kind. A type in the strict sense does not exist. The conditions that make these variations excessive and disease, are the subject of the modern pathologic work. As this work has necessarily to resort to physiology, chemistry, physics, besides the morphotic investigation, the attempt to solve the problem and to bring out

explanations must command the co-working of all of these sciences. This co-work is as yet not perfect, and that is the explanation of the isolation, thus far, of all of the single results that these attempts have given. They are valuable and will ultimately serve their purpose for the explanation of pathologic conditions, when they are combined and mutually arranged. This cannot be done now. Our knowledge of the intimate nature of the functional and physical and chemical processes in life, in health, and in disease, is hardly beginning; it is by no means near completion. The work of the great number of scientists investigating in this line will for a while remain inert until the way has been found to bring them in harmonious connection. It would be impossible to mention the names and works of all of them; many of them belong to our country, and a great deal has been done in Germany. At the present time the insufficient degree of knowledge, chemic and biologic, about the character and function of certain tissues leads frequently to far reaching conclusions, but which by improved and somewhat altered methods show to be unjustified. To illustrate such a difficulty, an instance may be cited that explains what is meant by the above remarks. The increase of blood pressure in Bright's disease was explained by Bier as the consequence of a reflex originating in the glomeruli and acting as a compensating factor. Others assume that a hypertrophy of the suprarenals with an increased amount of adrenalin in the blood, is at the bottom of the increase of pressure. In France some cases of nephritis in hypernephromatous formations were found. Wiesel, who took up this question[1], [2], [3], observed twenty cases of Bright's disease where at autopsy a hypertrophy of the medullary portions of the suprarenals was found. Working in accordance with this finding, he came to the demonstration of an adrenalin anemia in nephritis. He experimented with the serum of nephritis on the eyes of frogs and found an intense dilatation of the pupillæ. Normal serum does not produce it. He demonstrated in the nephritic serum the presence of adrenalin, and concludes that in nephritis the substance circulates in the blood, contracts the peripheral vessels, and thereby causes the increased blood pressure. Kretschmer succeeded in demonstrating that, experimentally, the injection of adrenalin into the circulation can produce a lasting increase of the blood pressure. These results were very widely accepted as an important addition to the pathology of the obscure etiology of nephritis. Naturally it called for control observations and their latest development is represented by a paper by Schlayer,[4] showing that the action of nephritic serum on the blood vessels and on blood pressure is, in most cases, slighter than that of normal serum. Only in three cases the first was more potent. Instead of assuming an increase of adrenalin in the blood of nephritics, he states that the quantity must be smaller than in normal blood, unless some other inhibitory substance is present in nephritis causing the apparent decrease. This is an instance which proves that the principles for the investigation of the functional pathologic processes are not yet fully established, owing to the great difficulty, physical and chemical, to identity

organic products. If this obtains for such definite and chemically definite substances like adrenalin, we must be more careful with substances immensely more complex, like the proteids.

The experimental work with tumors has made great strides, although the tumor problem has remained as obscure and widely discussed as before. The splendid publications by Ehrlich, reviewed last year, have led the way and have brought out a very great amount of investigations on tumors of animals of all classes. As a résumé of the results of this work a few points may be mentioned. Of first importance is the positive demonstration of immunity processes in animals (dogs, mice, etc.), first observed by Jensen and, experimentally, later studied by Ehrlich. The latter's observations have been confirmed in numerous experiments[5], [6], and have the more explained why the character of a malignant growth must be called parasitic, an interpretation that Ribbert advanced by showing that the tumor cells have all of the characteristic qualities that combine in the conception of parasitism. That the host is the producer of the parasite in the case of tumors is not an objection, being paralleled in the normal parasitism of the fetus in utero. The name parasite for a tumor is unobjectionable from biologic, morphologic and physiologic points of view. Of course this is only a change of a name; it does not explain. That such interrelations really exist has been proved by Ehrlich and has led him to assume an atreptic immunity due to the greater avidity of normal cells to certain important nutritive substances (Wuchsstoffe) than the tumor cells possess. The reverse condition will allow the tumor to grow. Very interesting observations were made by Beebe[7] and Tracy[8] in this direction on a lymphosarcoma in dogs. That the possibility of a spontaneous and also post-operative transplantation exists has been shown by Sticker by a carcinomatous growth of the external genitals of dogs, that by coitus is transmitted from the one to the other and kills the animal by metastasis. The peculiar influence that a cancer in mice has on the lack of susceptibility of the animal to other inoculations, the increase of the virulence of a tumor after continued transplantations, and many other questions, have received much attention, especially by Michaelis,[9] Harland,[10] Bashford,[11] although no uniformity of opinion or explanation has yet been reached. A very peculiar condition is the absence of a definite specificity of this immunity. Tissue of a sarcoma will protect against a carcinoma, and vice versa; Ehrlich has found a similar status for a malignant chondroma. The most surprising feature of the question is, that it was found that even normal tissues of the embryos of mice will protect; that even liver tissue of an adult mouse will have this effect when injected into an inoculated mouse. The explanation that Ehrlich gives is based on his hypothesis of atreptic immunity; Bashford and v. Dungern contradict this and attribute it to other causes. The most interesting observation made in this work is that in Ehrlich's[12] laboratory, for the first time, in a series of transplantations of a certain carcinoma from mouse to mouse, a typical sarcoma grew mixed with the other tumor, and, in the later implantations finally wedged out the latter altogether.

The observation has been made also by Bashford. These observations, the correctness of which cannot be doubted in view of the careful work done by all parties, lead to the question of the origin of this sarcoma, growing secondarily after the transplantation of a pure carcinoma in numerous passages. Ehrlich sees two possibilities; either the presence of a sarcoma-anlage primarily in the inoculated carcinoma tissue, or a later stimulation of the connective tissue stroma of the cancer to sarcomatous "change." In his latest publication he prefers the latter explanation.

This discovery leads to the investigation and discussion of the origin of tumors. While generally this problem has been touched very little, it cannot be denied that the tendency almost everywhere is towards the assumption of fetal displacement of tissue as the origin. Although no direct proof of this theory is extant, and no observer has seen the first beginning of a tumor, Borrmann has shown that cancers consisting in section of only about two dozen cells, have, at this early stage, their typical characters, and appear absolutely independent from the surrounding tissue. In spite of the constant objections of Hauser, it has never been demonstrated that tissue surrounding a tumor partakes, by malignant changes, in the growth and enlargement of the tumor. A transition from normal cells to tumor cells cannot be demonstrated. From the beginning, therefore, a tumor is a tumor, independent from and not physiologically connected with the tissues in which it appears. This is the salient point established. A tumor always grows only and alone by proliferation of its own cells.

The question whether only embryonic cells or also normal adult cells, can undergo tumor formation cannot be decided. The theory of Ribbert that normal epithelia can be disconnected from their physiologic arrangement, and under the stimulus of chronic irritation by inflammatory processes, separate, proliferate and finally become malignant, is in agreement with the growing importance of the interrelation of the different cells of a tissue between themselves. Only by such mutual tension or pressure can the unlimited proliferation be checked. A skin graft can by continued transplantation form a million times the amount of tissue it would have reached during a life time in the area from which it was taken. Such an interrelation must exist; its physical or chemical explanation will be found sooner or later. His experiments on the relative importance of regeneration, especially in the lower classes of vetebrates, have led Morgan[13] to accept similar views of a mutual dynamic relation between the cells of an organism. Dungern,[14] in an exceedingly interesting book on the nature of malignant tumors, in which is found the most objective critic of every suggestion ever made on the origin of tumors, has considered the question on the basis of experiments made by him. Their especial arrangement cannot be detailed here, but the results obtained led him to conclusions of the following nature. The authors show that by suitable use of different stimuli, qualitative changes of cells can be produced that can be recognized even morphologically. It is of peculiar interest that the same changes occur in the tissues of old indi-

viduals. The cells in these are almost insusceptible to all of the stimuli utilized; only more intense stimuli will cause proliferation. Weigert in his time had taught that such stimuli brought about a lowering of the inhibitory quality inherent in the cells, so that proliferation is the consequence. In normal cells the adaptation to normal inhibition of growth is quickly achieved, even when these cells are removed from their connection and transplanted into another tissue. Dungern asserts that the separation of cells from a physiologic connection alone never can, as Ribbert believed, produce a fundamental change in the form of growth of these cells. The change cannot be brought out by a change of the correlation of the cell, but must always be caused by a change of their reactive capacity. The normal reactive capacity is the important factor that regulates the processes of growth. The principle of the histogenetic equilibrium is based on it. Continuously rapid proliferation characterizes the malignant tumors, as the investigation of Ehrlich and Apolant have shown. This rapid proliferation can only be brought on by damage to or destruction of the inhibitory capacity and by the loss of the cell of the adaptive and restitutive capacity. Proliferation, endless and limitless, must be the consequence. The decrease of the restitutory power can occur also in normal cells, if stimuli of high intensity are applied in short succession, so as not to allow the cells to recuperate. It is conceivable that stimuli exist which act only on this capacity and leave the other factors intact. This may play a part in the formation of a tumor. No explanation of tumor formation can be accepted but one that figures with the biologic change of tissue cells. The similarity between tumor cells and embryonic cells assumed by many authors does not exist; in studying the reaction from a stimulus for growth the author found that the tumor cells behave in an opposite way to that of embryonic cells. It is unnecessary to insist on the necessity of controlling von Dungern's and Werner's experiments; when confirmed their investigations will form the possibility to decide about the question of tumor formation from embryonically misplaced cells, or from adult tissue cells, deprived by some external or internal influence of their capacity of afterwards restituting their inhibiting factor. If it were not for the unobjectionable experiments reported in the book, the explanation, although biologically feasible, would appear as a theoretic possibility only.

The opinion that external noxes may be the cause of carcinomatous behavior of epithelium has for a time been greatly strengthened by the work of Fischer, reported last year, on the production of epithelioma-like proliferations in the ear of rabbits. The method used was the subepithelial injection in the ear, under considerable pressure, of a solution of a fat-staining substance, the scarlet red or the sudan red in pure olive oil. The effect thus caused was found in the dipping down of the cutaneous epithelium by the growth of the interpapillary processes, forming around fatglobules and masses, epithelial structures of an epitheliomatous character. In some cases where the cartilage was injured by the needle, such epitheliomatous masses were found in the cartilage. Microscopically, the picture is very suggestive as the reviewer was himself able to ob-

serve. Others more or less confirmed the observations of Fischer, although negative results were reported when the oil was injected under slight pressure. McConnell[15] in this country confirmed, also, the correctness of Fischer's report, and was inclined to believe that the formations produced were suggestive of a carcinomatous character, although expressing his opinion that a definite decision could not be arrived at from them. Fischer[16] had no doubt that these formations were representative of a malignant type of proliferation, and formed on this belief his attraxin hypothesis. He explained the condition by the presence of certain substances, called by him "attraxins," that caused the epithelial cells to grow towards them, in this way being separated from their physiologic inhibition by other cells to which they belonged, and then exerting their innate capacity of proliferation without restraint. The theory comprised a great field and had a chance to become accepted as possibly corresponding to the truth, if many of its evidences had not been proved as incorrectly interpreted and not conclusive. The fact was that the proliferations produced did not extend, but after a short time were obliterated by atrophy; that this apparently malignant character was definitely simply produced by mechanical factors, and that the proliferation was, more or less, nothing but the ordinary proliferation of the epithelium that we see so frequently in certain inflammatory conditions of the skin. Fischer's work is valuable by showing what agents can cause a proliferation of epithelium, but it throws no light on the causation of cancer. Snow[17] has come to the same conclusions expressed here. As to the etiology of cancer, it may be mentioned that Gaylord[18] and others have reported the finding of a spirochæte in a number of mouse carcinomata. Whether they have any etiological meaning is a question that cannot be answered at the present time. Dungern suggests that the origin of carcinoma, that is the permanent destruction of the adaptation of cells to the action of the destroying stimulus for the inhibitory capacity, may be of bacterial origin. Proescher and White[19] have published similar findings in a few cases of acute lymphatic leukaemia and other lymphatic hyperplasias. What the meaning of these observations is cannot be told at the present. For the lymphatic pathologic conditions a possibility obtains; whether it is so in cancer time will show.* That malignancy is not restricted to sarcoma and carcinoma is well known as occurrences of malignancy of myomata, lipomata and chondromata have been found. It is interesting and important to add to the list and so reference may be made to a paper published by Borrmann.[20] He gives the history of a subcutaneous hæmangioma of the breast in a young woman, that, in spite of several operations, always recurred and led to death after three years by extensive metastatsis in both lungs. The histologic structure of the tumor differed in nothing from that of a simple

*After finishing this review another paper by these authors announces the same findings in other cases, and at the same time the production of typical lesions by the inoculation into animals of material taken from these cases. The lesions were similar to those in man and contained spirochætæ in large numbers.

angioma; its character was the same in all of the metastases. The impression that all of these cases impart is that malignancy is not limited to certain cell types, but is a quality generally possessed by all genuine blastomata.

As a work that in the great demands on time, large knowledge of literature and objective critic of the author, is unexcelled in medicine, may be mentioned, the history of carcinoma from the oldest to modern times, written by Jacob Wolff;[21] a big volume that must have taken many years to complete. It will have lasting value as a source of reference to everybody interested in cancer questions. Mentioned as a curosity is the paper of Westenhoeffer,[22] who makes primitive cells ("urzellen") the cause of tumors. A paper by Ruelf[23] gives an answer to it.

Voit[24] in a lecture on the conception of mesenchyme and the organs developed from it, calls to the attention of embryologists the fact that the mesenchyme is not a uniform structure, but that it is composed of elements of ectoderm and entoderm. The elements of both are mixed in forming the mesenchyme and the structures arising from it, in some cases, have been proved to arise from elements derived from two germinal layers. A detailed review is not in place here; however, it must be mentioned that the changes in the conception of the mesenchyme may have some influence on the classification of a number of tumors that cannot be arranged according to the accepted rules.

It will be remembered that Ribbert's attack on the conception, that the changes of an inflammatory reaction are to be considered as protective, that is, as a means of utilizing given conditions, was not intended to bring out a new view on inflammation, but only an attempt to keep this humanization of natural processes in science in its proper limits. That really, the neovitalistic tendency today, especially as enunciated by Reinke and Driesch, is a great danger to scientific work is clear; its effect is the same on pathology. We are too prone to work for the purpose of some phenomenon and forget, often, in doing this, the most essential features of a problem. Jensen,[24] of Breslau, in a fascinating book, has brought this subject to a thorough discussion, and shows definitely, by strong logic, how untenable are many favorite and apparently valuable theories about development, heredity and utility (Zweckmaessigkeit). He opposes to these merely speculative "fundaments," the physico-chemical conception, for the reason that the inner factors of development consist in the configuration and energy relations of the living system. He ridicules especially Weissman's ideas and the importance that today is attributed to the role of the nucleus and the chromosomes in heredity. Jensen's book is exceedingly positive, but in every word based on correct thoughts and knowledge. The tendency to the neovitalistic ideas is very insinuating in pathologic problems, especially in the work done today on changes from normal to pathologic conditions. The book ought to be widely read.

Before entering into some remarks on the work in pathologic anatomy, it may be desirable to call attention to a problem, not directly pathologic, but touching pathology as nearly as any other branch of biology. It is

the increasing evidence of the frequency of the occurrence of continuity of cells in various organs and places of the body, as a continuity not showing separate cells, but a uniform mass of cytoplasm, either appearing as compact masses, or divided into cell-like portions and connected by protoplasmic strands. The number of such observations is not great, but it is of great importance in a problem that is beginning to dawn in the background of our basic principles of organic life, the cell theory. The problem is this: Is it true that the body of an organism is composed of cells, or does the body form the cells for mechanical, physical or chemical reasons? So many phenomena in the construction of an organism are hard, or impossible to explain by a connection of cells; I need not mention here more than the nervous system. The problem will become prominent in the near future. Terry[25] has demonstrated in a fish (batrachus), that the neuroglia forms a typical syncytium with no divisions in cells and with the nuclei irregularly distributed. His in 1886 had already found a syncytium (myelospongium) in the human embryo, and Hardesty had found that the neuroglia of the pig was also syncytial. If further investigations with suitable material will make this the universal condition, a very important advance in the solution of the problem will be made.

Remarkable advance in the problems of pathologic anatomy has not occurred; in fact, none of the old questions pertaining to many of the obscure conditions, has been answered. In regard to the circulatory system two publications are of note. The first is a classic product of the work of an anatomist and a clinician. Hirsch and Spalteholz[26] have investigated the assumption, usually pronounced, that the coronary arteries in their branches do not show any anastomoses, at least not of sufficient extent to counteract the occlusion of one of the branches. They were led to this investigation by the frequently found extensive infarcts, without any interference with the functional quality of the heart muscle. If occlusion of one of the larger strands could not be compensated by sufficient anastomotic conditions, such a result could not be the outcome. In a very original and ingenious way they caused this condition in animals by ligation of one of the first ramifications of one of the coronaries, and studied the effect in the specimen after it had been injected and afterwards made translucent by a special method. In this way the filled blood vessels can be followed through the whole heart in small animals, and at least through the thickness of the wall of a heart in animals of larger size. In normal animals they found a very copious system of anastomoses, not of small caliber but rather large, and fully sufficient to provide for the area cut off by the thrombus or by ligation. This accounts, too, for the apparent incongruity between the site of obstruction and that of the impact. The latter is often at a great distance from this site. Very interesting are the investigations Wiesel[27] has published on the lesions found in the arterial system after acute infectious diseases. In about 80 autopsies on cases of diphtheria, scarlatina and other acute infections (age from 3 to 25 years), he examined the arterial vessels and found the arteries greatly altered in all

of them. The changes appeared as a degenerative process in the musculature and the elastic fibres of the media; here they appeared first, and only sometimes involved the intima. This degeneration is focal and can lead to a necrosis of the vascular wall. In marked cases the lesions can be recognized even macroscopically. All of the arteries, down to the caliber of a digital artery, are affected; the aorta, cerebral and heart vessels, also, are highly involved. Wiesel differentiates two groups, one with prominent degeneration of the elastic fibres (diphtheria, typhoid, pneumonia, influenza), and another with main involvement of the muscular tissue (scarlatina, sepsis, etc.). The discovery of this arteritis, perhaps accounts for the cases lately described by several observers of juvenile arteriosclerosis, the more so, since in the majority of these cases the absence of a chronic nephritis was established. The lesions of this arteriosclerosis are, however, different from that of old age, by beginning always in the media and not in the intima, as was demonstrated by Jones[28] three years ago. The author gives the name of arteritis chronica post infectiosa to the affection and on account of its frequent occurrence, calls for a thorough investigation as sometimes it is the cause of death from acute infections.

As the effect of adrenalin on arterial lesions there is recognized some difficulty in drawing conclusions from experiments made on rabbits. Although results are on the average uniform, the fact cannot be ignored that rabbits, either killed in normal condition for some purpose, or dying from other causes, on autopsy show lesions that are absolutely identical with those produced by adrenalin injections. Kaiserling[29] has observed a few such cases, and Ophuels[30] reports one of the same character. It seems necessary to establish the percentage of such lesions in untreated rabbits, especially in the single races, before reliable conclusions can be drawn. The reviewer does not doubt the correctness of the conclusions from the experiments reported so far, still in important questions this point may lead to error.

The character of the hematopoietic structures and the relation to each other of the different forms of leucocytic elements, as well as of those cells appearing in inflammatory conditions, remains just as it was before. The consensus of opinion of the majority of writers is for adherence to Ehrlich's statements of the histogenetic difference between the so-called lymphocytic and the polynuclear cells, the latter with their premature stages (myelocytes, etc.). That is, at least, the conclusion to which Helly[31] comes in his dealing with the relations of the blood-forming tissues to diseases of the blood. The confusion about the origin and derivation of cells occurring in inflammatory tissue, the plasmacells, mastcells, polyblasts, etc., is as great as before. The assertion is still made by some that plasmacells are able to change in or arise from connective tissue cells, while others, and apparently more correctly, connect them with the small lymphocytic elements. That there is no direct possibility of reaching a definite conclusion has been shown lately by Councilman through his study of the lymphatic tissue in infectious diseases. He is satisfied with differentiating different forms without forming an

opinion on their histogenetic character. It would be a great satisfaction to finally arrive at a positive knowledge of these interrelations or differences, as, for instance, the assertion that red and white cells arise from the same matrix. But for the present it seems impossible. The apodictic assertions of Pappenheim[32] are so subjective that they cannot be accepted as representing the real condition.

After four years the method of Arneth who has tried to establish, from the nuclear character of the polynuclear neutrophilous leucocytes in the blood, a system of diagnosis and also prognosis of a great number, in fact, theoretically all pathologic processes, a method based solely on the more or less advanced nuclear distortion of these leucocytes and their relative percentage, has not succeeded in making itself a recognized addition to our knowledge. Although many papers have been published in confirmation, their theoretic value is nil. We know too little about the character and the causes of the nuclear changes in the circulating blood. We know, furthermore, too little about the function of the leucocytes (notwithstanding the claims of the opsonists) to base important measures and predictions upon the presence of a greater or less number of leucocytes with a nucleus appearing in two to five or more portions connected by chromatin bands. Paulinek[33] has made careful and extended control investigations and concluded that the difference in the condition of the nuclei is merely accidental and without significance as to the character or course of a pathologic process.

It is still a point to consider their total number and the relative proportion to the different other forms of white blood cells, yet even that, in many conditions, is of little importance and only relative. Theoretically the value of blood examination for diagnostic purposes in many pathologic processes, is not to be considered. The value in others is only based on experience; it is empiric and demonstration of its justification has not been established. This does not of course obtain for the information that the biologic character of the blood may give on this phase of the question; the bacteriologic part of this review will have something to say on this subject.

The subject of blood diseases has had much attention by individual observers. For the leukæmias general consensus about classification, as to etiology and relations to pseudoleukemia, has not been reached. A paper of McCallum[34] offers a prospect that the diseases of the hematopoietic tissue and of the lymphatic apparatus can be grouped together in a definite form. The author's remarks on the confusion dominating the literature of lymphatic diseases are very true; he gives a lucid description of the definite characterization of pseudoleukemia and lymphosarcomatosis from cases observed by him. The misfortune is that the literature so far published on the subject is so varying in exactness of description that it will be of little value in the final elucidation of the forms of lymphatic hyperplasia. The finding of a spirochete in three cases of Hodgkin's disease and one case of acute lymphatic leukemia has been mentioned before. That even pernicious anemia is a different thing, in the minds of different observers, was plainly shown in

a discussion following a paper read by Plehn[35] in which he established two different forms of the disease. The discussion by a number of well-known hematologists demonstrated the uncertainty about the really essential pathologic conditions of this form of anemia and the most surprising thing was that the most essential of all, and the one that must strike one's eyes at the first glance, is the typical character in shape and size of the red cells in pernicious anemia; a point on which Ehrlich established a concinct picture of the disease was not touched upon. If pernicious anemia shall be established as a pathologic entity, which it is clinically and pathologically, a discussion of the diagnosis is absolutely unnecessary, and the long time spent on it in Berlin this year was entirely wasted. An interesting paper about the embryonal character of the red corpuscles in pernicious anemia was written by Engel.[36]

Interesting are two observations in regard to pancreatic diseases. Fat necrosis was pronounced almost unanimously an effect of pancreatic disease. It is true that certain occurrences of this necrosis were known without any noticeable lesion of the pancreas, but it could not be denied that in the overwhelming majority the necrosis either was directly caused by disease of this organ, or, where the organ appeared normal, at least was always located in the immediate neighborhood of it, so that the suggestion of only functional anomaly was justified. These observations did not invalidate Opie's assertions and theory. When, however, multiple fat necrosis occurring in the skin is observed without other lesions, and above all with a normal pancreas, this theory must be at least modified. Fabyan[37] reports a case in an infant some seven weeks old, that from the second month after birth began to show on the skin (cheeks, arms, legs, back) large and small peculiar lesions at that time called abscesses. The infant died by accident, and the autopsy by Fabyan revealed these abscesses to be typical fat necroses. Naturally the investigation of the whole body was very thorough, but neither macroscopically nor microscopically could anything abnormal be found except a few petechial hemorrhages on the heart (cause of death suffocation). The other observation was made by Lazarus[38] who, in producing diabetes by phloridzin could regularly produce an enormous hypertrophy of the islands of Langerhans. The theory of the causation of true diabetes by atrophy, or other defunctionating factors acting on these islands, held by Opie and others, has, on the whole, not received much attention this year. In several publications, however, single cases are reported, where the conditions pictured did not obtain. As we know that typical diabetes sometimes is nervous in origin, and can be produced by lesion of a certain place of the fourth ventricle, the opinion that a diabetic metabolic disturbance can be due to different causes, among them, perhaps, to this atrophy of the Langerhans islands, should be followed.

Tuberculosis may again be a link in the consideration of the pathologic and the bacteriologic work done this year. The real progress in the dealing with this disease can only come about by a union of the two ways of investigation. It is the pathologic side of the question that has

stood in the foreground this year, due to the great shaking up of seemingly established principles by the publications of Behring and Koch a few years ago. Pathology had to determine how the entrance of the virus was effected, where the primary penetration of the bacilli occurred; in other words, the question had to be settled, whether the old idea of entrance through the respiratory tract (so-called inhalation) or entrance through the intestines, obtained. The latter, for two years, has, seemingly, advanced in importance by a large number of experiments with animals, in which, by the introduction of tubercle bacilli into the stomach, or directly into the intestine, tuberculous infection was produced that resulted in pulmonary tuberculosis. In Germany (Aufrecht[39]) a number of investigators fought for the intestinal origin of the majority of pulmonary infections, and these stand in the foreground in considering human tuberculosis. It was this experimental work, and the belief that bovine bacilli played a great part in the origin of human tuberculosis, especially during childhood, as they are certainly multifariously introduced with the milk into the intestine that lead to these thoughts. In France, Calmette[40] leads a large number of followers, asserting that inhalation tuberculosis is rare, and that the intestinal infection is the rule.

From the beginning of this dissension of opinions, pathology had to decide for inhalation as the source of human tuberculosis. It is not to be thought that an infection should start in the alimentary tract leaving, in the great majority of cases, the whole tract, the abdominal organs and even the mesenteric lymphatic apparatus intact and do its work later in the lungs. The whole character of the human disease is chronic, that is, a gradual extending from one place to the other, a slow creeping and burrowing, leaving destruction and death of tissues in its path. Until it reaches a distant place many years must often elapse; very often, even in most cases it does not reach them at all. We find in autopsies of pulmonary tuberculosis frequently not more than a few small, recent tuberculous lesions, always in their histologic character, much younger than the lesions in the lungs; very often none at all are found. Of course, there are exceptions to this, and lesions are more advanced, but then there is no evidence for a primary entrance through the intestine; the latter is almost always intact; only the mesenterial glands are infected. Fresh lesions of the mucosa are more frequently found in later stages, due to the swallowing of the detritus from the pulmonary foci. The inhalation experiments, made by Cornet years ago, demonstrated typically the possibility of infection by inhalation. The contradiction between the modern work on producing pulmonary tuberculosis by intestinal infection, and the experience and the solidarity of all observations for many years before in favor of respiratory infection, has not been explained. That it ought to be possible to explain this, was the conviction of R. Pfeiffer,[41] who considered the question by comparing these artificial intestinal infections with the natural way of infection in man and animal. He was assisted in this attempt by the simultaneous determination by others of the nearly exact quantity of virus that must be introduced in order to cause an infection. For guinea-pigs the num-

ber of tubercle bacilli that are necessary to infect must not be smaller than four hundred bacilli. A less number may cause a local process, but will not lead to a dissemination of the disease. As the guinea-pig is the most susceptible animal we know for tuberculous infection, and on account of the great resistance of the human being against infection, the estimation for the human being will reach only moderate figures. The proof for this lies in the high percentage (about 95 per cent of healed tuberculous lesions found after death from other causes than tuberculosis. So Pfeiffer arranged his experiments by trying to produce a natural infection in guinea-pigs in both ways. A series of 25 animals was exposed for about ten minutes at a distance of 15 cc. from the nozzle of the spray, in the open air, to the spray of an emulsion that contained about 30,000 bacilli in 1 cc. Altogether 1 cc. was used, so that if all bacilli had been inhaled by the 25 guinea-pigs, each would have taken about 1,000 of them. As this assumption is out of the question, the estimate may be placed at 400. Another series was by tube injected into the stomach, with 10 cc. of the same emulsion (300,000 bacilli). The result was that when killed, after about ten weeks, all of the first series showed caseous nodules of large size in both lungs. In most of them the bronchial glands were involved. In two or three, small hyaline tubercles were found, in very small numbers, on liver and spleen. The series with intestinal infection behaved in this way: Twenty-two of the animals were absolutely intact. In three some mesenterial glands had been infected and in one of them a few large caseous tubercles were found in the lungs. The latter had the size of those in the inhalation animals, and as these two struggled while inserting the tube, some of the emulsion may have entered the larynx. The result is so clear and patent that with one glance the answer is given. The positive results obtained by others do not correspond to natural conditions and cannot be compared with them. In these experiments the virus introduced consisted of such an excessive amount (many millions of bacilli) that necessarily a susceptible animal must be overwhelmed by it. Under natural conditions such a process is impossible. Pfeiffer's stomach animals received 300,000 bacilli and 22 of 25 remained well. If we consider the number of bacilli present in 1 cc. of human sputum and are aware that most of the exudate is swallowed regularly with the saliva, and compare with this the comparatively rare secondary infection of the intestine, everything is said about the intestinal origin of pulmonary tuberculosis. That it occurs, especially in young children, there is no doubt, and nobody denies it, but in only a few exceptions could pathologic proof be shown that the intestine produced the pulmonary secondary infection. Inhalation of the tubercle bacillus will be, in the future, as it has been since the time of Koch's discovery, the object of preventive measures until the time comes when the diagnosis will be made before the sputum shows the bacillus, and until that time the patient will be harmless to his surroundings. Prevention ought to work constantly in this direction; the medical profession, in the first place, ought to achieve this by early diagnosis and by submitting early cases to procedures, like those used

today for open tuberculosis of mostly doomed individuals. That the introduction by inhalation is in many ways possible, is known. But more importance ought to be given to the droplet dissemination by the talking, laughing and coughing of a patient. The number of bacilli expelled in this way, and floating for hours in the air, is sometimes remarkably great, and the danger of inhalation a certainty. A valuable contribution to this subject is the paper of H. Ziesche.[42] To cite, singly, the names of all of the men that have worked during the year on the discussed incisively important problem would be useless. The gist of their conclusions was given.[43]

The second question is the truth or untruth of Behring's assertion that tuberculous infection is almost always acquired during childhood, and that the later tuberculoses are in direct or indirect connection with it. This is hard to prove or disprove directly. But if experience is of any value and life histories mean anything, we can confidently assert that Behring is wrong and that most tuberculous infections in adults are acquired long after childhood has been passed. Of course, we know that a focus may for many years remain latent and that almost everyone of us during life has had, or still has, such a focus.

The question of the influence of bovine bacilli on human tuberculosis can be discussed in a few words. Correct consideration of the question shows only the improbability of such a possibility. We have sufficient knowledge today of the chances we are said to run daily with food from cattle. That this fear is absolutely unjustified to that extent is today certain. That now and then the occurrence of infection through milk, etc., has been demonstrated is of no great importance at present, in view of the ease with which the infection by human bacilli can be proven. As a general sanitary measure, the elimination of bovine disease is advisable; as influencing the rate of human tuberculosis, it should not be considered. The subject of tuberculosis cannot be left without at least mentioning two methods of diagnosis of early or obscure tuberculosis, that lately have become known, but about which as yet so little experience obtains that general conclusions must be drawn very carefully. The prospect, however, that both of them will in the future form an important addition to the means of fighting against the occurrence of open tuberculosis is very great and almost certain. The first method, described by van Pirquet,[44] is the utilization of the sensibility of the skin of tuberculous persons to tuberculin. The fundaments for the method may be found in the author's book; the publication of the method itself is only about six months old. It consists in a slight abrasion of the epithelium in the skin of the arm, or other place, and the contact of the abraded surface with a small amount (one drop) of the old tuberculin. The latter is allowed to penetrate thoroughly and be absorbed into the cutis. After a number of days (5 to 10) the locus of application becomes red, and forms, after a few days, a small nodular, papular and often vesicular, lesion; while a surface abraded in the neighborhood of this lesion and only kept in contact with sterile salt solution will not show any reaction. The lesions heal

gradually and no general effects are present during this reaction. It is positive in cases where the tuberculous process has not advanced too far, and especially valuable in infancy and childhood. Early tuberculosis in adults, however, will also show the same reaction. While the majority of reports are confirmative, some have met with failure. It is too early to speak the last word, but as said before, there is much reason to expect that the method will soon be generally used to the benefit of the race. The histologic character of the small lesion partakes of the nature of a tuberculous inflammation similar to that caused by killed tubercle bacilli.

The other method, devised by Calmette, of Paris, uses either the old tuberculin or the new tuberculin (T. R.). A small quantity of one of the substances is instillated into the eye over the conjunctiva. The result is a more or less marked conjunctival redness and swelling and sometimes a conjunctivitis, that always passes off in a short time, and without any general reaction. Which of these two methods will prove to be the most useful one cannot be said at this time.

The new edition of G. Cornet's book,[45] a large volume, with vast experience and practical and experimental work as its base, really gives everything of our present knowledge on all features of tuberculosis. For reference no book is better adapted.

In other diseases bacteriology has made some strides forward, not so much in special bacteriologic work, although there, too, advances are marked, but mainly in the line of the biologic interrelation between host and infecting micro-organisms. The work done continues along the lines outlined by Ehrlich. Although the idea that this great man's explanations of the phenomena studied is the so-called true explanation, can hardly be entertained by any thinking worker, a point, of which Ehrlich himself is fully aware by calling his theory a heuristic theory, it is an attempt at explanation that, from a physical and chemical basis, has been built up with such a degree of dexterity, logic and originality, that it has led to the establishing of some immensely important and revolutionizing facts, that on Ehrlich's and his followers work every future study of the same subject must be based, in fact could not be achieved without it. The attempts to identify the phenomenon with physical-chemical reactions has utterly failed, and even the endeavor to liken them to the behavior of colloid substances is unsatisfactory on account of the confusion obtaining on the physical and chemical nature of the colloids themselves. There is one factor that cannot be explained as yet by any exact science that is the specificity of the processes observed, that goes deeper than is ordinarily imagined. It is, of course, evident that this factor does not find any explanation in Ehrlich's theory, itself; it is, however, a fact observed with such exactness and such reliability, that it is not to be doubted; that it is there, is proved by the effect it has had on carrying this work to a line that only ten years ago would have been thought fantastic and beyond the range of logic and science. Of these late developments at least one may be to some extent discussed here. It was found by Bordet that bacteria have

the power to absorb complement and by their presence to make the reaction of hemolysis negative, if they are suspended in a specific immune serum, or have been charged with amboceptors. The binding of receptors to amboceptors results in a great avidity for all of the complement; this phenomenon occurs only when the one is specifically adapted to the other. If an immune serum not specific for the bacterium is used, the hemolysis will take place. This was the discovery of a method that established differences in character of very similar bacteria with a nearly absolute reliability. It was possible to discover in a suspected material the presence of specific bacteria by this method, although the organisms themselves could not be found. On the other hand, doubtful forms could in this way be identified. As valuable as this method is, it has a limited range in its use; it is complicated and serves with bacteria as such only somewhat better than other methods more convenient. The specificity of this action and its distinctness in the minutest quantities of bacterial material called for wider application. Wassermann investigated whether only bacteria, as such, gave this reaction, or whether the secretory or autolytic products, or the substances arising from their disintegration, could be utilized for this purpose. He found that the reaction was just as delicate with extracts of bacteria, sharper because the dilution of the extract could be carried out with much greater exactness. After the method had been tried with the extracts of a number of bacteria, and in all of them had been found reliable, the hope naturally arose, that even in pathologic conditions in which we cannot cultivate the specific agent, or in those in which the agent is not known it might be useful. As it was known that a specific antigen (receptor) and antibody were necessary to allow of the interference with hemolysis, and as in any infected organism, the first must be present, and, perhaps, the second too, the way was opened for exact experimentation. For tuberculosis, where, to a limited extent, the presence of tuberculin and antituberculin could be demonstrated, owing to the great differences in the single cases of the course of the tuberculous process, the results were not uniform; and as the causes for this insufficiency can only be guessed at, not exactly determined, I think for tuberculosis the reaction will be of use only in a limited number of advanced cases, but always in early cases.

With the difficulties of diagnosis in supposed syphilitic and so-called parasyphilitic conditions, where the clinical or microscopic determination of the origin is very often not directly demonstrable, except by comparison, it was a necessary thing to try to use the absorption of complements for this purpose. We long knew that lues is contagious; we know its etiology; but we can not yet cultivate the spirochæte pallida. The clinical appearance of syphilis is altogether that of an infection with processes similar to other infections. The attempt was first made with established syphilis. In the beginning the positive results were not so frequent. The explanation was that in most of the luetic cases a more or less intense antiluetic treatment had preceded the examination. For examination the serum, cerebro-spinal fluid and extracts of

syphilitic organs, were used. The antibody was given by the serum of monkeys infected with syphilis and recovering, and from rabbits injected for some time with syphilitic material. The hemolytic system was always the same; the possible mistakes were excluded by a great number of control tests and in this way formed a basis for wider investigation, making a positive result always definite, but allowing for few failures from causes that either can be explained or are obscure. Wassermann[45] and his associates, Plaut and Bruck, then commenced to examine the cerebro-spinal fluid, and sometimes the serum, of cases of tabes and general paralysis. Their first results were surprising, as in almost all of them a positive reaction was easily established. Since the first communications on the subject, a number of investigations were made by Citron, Morgenroth and others,[46], [47], Citron using the serum, but sometimes also the cerebro-spinal fluid. The clinical suspicion and the strong belief that these two diseases occurred almost always in a connection with a previous luetic infection, and that, therefore, they were specific sequelæ of this infection in all cases, seemingly is confirmed by the complement fixation reaction. The question is whether this is only a coincidence, or a definite specific so-called parasyphilitic process. That is not proved directly, but experience teaches that similar relations are found in many other pathologic conditions of an infectious character. Theoretically it is not sure that the antigen and antibodies reaction in syphilitic material really represents the products of the spirochæte and the specific receptors, because it is present in the infected organism. To prove this, it is necessary to have pure cultures of the organism and to carry out the investigations with their products. It is possible that the reaction-producing element has nothing to do with the substance of the spirochæte, but with absolute certainty is only found in, and, therefore, only produced in the organism of luetics. Its practical importance is firmly established, and its causative connection in its presence at the time of so-called parasyphilitic conditions, justifies the conclusions that they are the cause of the infection with that organism that only can produce lues. The hesitation to accept the positive reaction in almost all cases of tabes and of general progressive paralysis as proof is less justified than in many other conditions where we consider the presence of a certain factor alone as positive evidence of the correctness of the specification of the condition. Here we have to deal with a material that is found nowhere but in the substance of a syphilitic individual. At least no proof to the contrary has been made known, and the point is that this specificity is the main factor that has up to this day asserted its right to exist in a consideration of the problems of infection and to be its pivoting point. It does not have an absolute meaning; nothing has, but as far as we can go with our means or abilities, it is the only solution of the problem, and cannot be contradicted with similar weight from any other side, especially from statistical and empirical sources.

For other infectious processes the late biologic status is about the same as it was last year. Nothing absolutely new has come out, and little changes in single questions have not altered the picture. Our

knowledge about the meningococcus has been greatly widened, mainly through the success in finding suitable media for growth sufficient in quantity for animal experimentation. The animal inoculations, especially in monkeys, were reported last year (Flexner). They and other investigators have altered the conception of the seat of the disease in the nervous system to a septicæmia, like in typhoid. The case reported by Simon[48] cannot be counted because no culture was made. In other cases cultures from the blood have been positive. A very peculiar location of the main focus of this coccus was reported by Pick,[49] where a large pus production by meningococcus took place within the seminal vesicles. The relation of the meningococcus to the gonococcus has been carefully studied; it appears certain that a close relationship obtains between them, showing differences only in the character of the growth in cultures and by the agglutination. The one agglutinates the other, but much less than with its own specific serum. Flexner and Wassermann[50] have tried to produce immune sera by inoculating horses and goats. While in animal experimentation these sera prophylactically and shortly after the inoculation of the virus, prove effective, in the human disease the results (few) have been unsatisfactory. The reason may be the lateness of the time in which the injections were made.

As to typhoid and pneumonia, nothing has changed; details have improved, especially the cultivation of the bacillus from the blood. The stress of the endeavor to eliminate typhoid is today laid more on the prevention of infection by direct or indirect contact, and not on the water. It is an established fact that water infection always means an epidemic, while the typhoid that obtains here as well as in Europe is merely endemic and transmitted directly or indirectly from one patient to the other. An epidemic of typhoid is greatly different in fulminant dissemination from the ordinary endemic typhoid course, which varies little throughout the year, and is influenced in this simply by climatic and sanitary conditions. As to the Pfeiffer's bacillus of influenza, it was known that it could act also as a pyogenic organism. Cases of pure influenza peritonitis have been reported, one in St. Louis by Hill and the reviewer. A true influenza sepsis is lately described by Saathoff[51] in which the bacilli have been cultivated from the blood. This paper is interesting because the author succeeded for the first time in producing with his culture in rabbits, an influenza-septicemia with death, and was able to increase the virulence by successive inoculations. The rabbit influenza has no symptoms analogous to the disease in man. Pneumonia is the same as it always was. The great collective work done in the eastern part of our country has not in a single point changed our views. The organism of whooping cough is not found with certainty. Bordet[52] seemingly has succeeded in isolating a minute bacillus that, from its pathologic effect on animals, may finally be pronounced the etiologic agent of this disease. All the other whooping cough bacilli are by this time buried.

In the specific treatment of acute and chronic bacterial diseases, the principles that bacteriology has established obtain. Practically only the

sera for diphtheria and tetanus and, to a degree, that for streptococcus infection, are concerned. Bactericidal sera are, for definite reasons, excluded. There has been, however, for the past few years, a great activity in the administration of dead bacteria in chronic, especially pyogenic, processes. This, of course, is nothing new, and something that from our knowledge of immunity production was self evident. It had not been used much practically, on account of certain failures, due to the character of the culture used for the inoculation into the patient. We have learned not only for tubercle bacilli, but also for pyogenic bacteria, for typhoid bacilli, etc., that there are adaptations between host and parasite, of which the ones of the host are the more important for the purpose of eliminating the parasite. The bactericidal substances produced by the host have almost an individually greater affinity to their own bacteria, than to those of other individuals. Therefore, if the amount of antibody formation is increased by the introduced dead microbes, the susceptible elements respond readily and overproduce the protective substance, so that not only the effect of the injected bacteria is neutralized, but enough is left to kill the bacteria that keep up the infection. That such bacterial injections were used more during the last year is due to the general acceptation of the truth of a theory that has by its fascinating character done away with criticism and has taken a firm position in the minds of many believers. I mean the opsonin theory of Wright, for the formation of which he was held worthy by some of being named with Koch, Lister and Pasteur. The opsonic theory is based on the assumption that leucocytes combat infection by enclosing them phagocytically, and thus keeping them away from cells susceptible to their action. It is Metschnikoff's old idea but it has been placed in the background by the modern immunity investigations by reason of exact demonstration of other processes that produce immunity. Wright's assertions, based on a method that, to the critical investigator, is full of great sources of error, and not based on any definite knowledge of the nature of phagocytosis that certainly exists, should have been, from the beginning, more thoroughly controlled and refuted. It was the beguiling ease with which an object could be achieved, and had previously resisted other ways to deal with it. The fact that in any blood there are present substances that affect infectious bacteria in a way to enable the leucocytes to take them up by phagocytosis, is not original with Wright; it had been stated long before, and at the same time was submitted to thorough investigation by Neufeld and Rimpler. Under the name of bacteriotropic substances they were added to the manifold constituents of the blood. What their object and nature was could not be discovered. Wright, we must admit, independently took it up, and following a method worked out by Leishmann, modified it so that seemingly it was brought into a condition to be studied and dealt with in a similarly exact procedure as obtains for the immunity substances. His idea was that the leucocytes in infection had the task of destroying bacteria; that in any infectious condition the increase of the phagocytic activity was an attempt at elimination of the bacteria and conditioned by an increased

quantity of those bacteriotropic bodies to which Wright gave the name opsonins. Comparative observations seemed to show that in normal blood the opsonins are present on the average in about the same quantity, while under pathologic conditions the latter varied greatly and was as a rule lower than in health. The relation between these quantities is his opsonic index. To increase the index, to bring it above the normal, appeared to him to increase the chance for eliminating the infection; in fact, he gradually came to consider the work of the opsonins the only factor to be considered in combating infections. Naturally it suggested itself to him that a way to do this would be to use the addition of killed bacteria to those living in the affected individual; he used, therefore, the old method of bacterial inoculation for this purpose. In making injections of these, he soon observed a rise of the opsonic index and likewise an improvement of the pathologic condition. He read out of the curves of the opsonic index a direct agreement between its value and the condition of the patient. The inoculations were regulated in time and amount according to this index. The results obtained by him and by many enthusiastic followers, some with great reputations as authoritative men, were good, exceedingly good in many cases; especially many cases of skin infection that had resisted the efforts of dermatologists for years yielded to this opsonic treatment. A great era of successful scientific treatment of as yet unmanageable troubles, was foreseen, and in England and our country opsonins were the all absorbing subject of admiration and of work, following exactly and with no criticism the ways of the master. Even Simon, of our country, although critically understanding the flaws in Wright's method, and supplanting it with a somewhat more exact procedure, took hold on the importance of opsonins. They are certainly interesting substances. The trouble is, we do not know what they are, how they act and what meaning phagocytosis has. In Germany there was a great silence about the new discovery; a silence caused by the clear understanding that the basis of Wright's theory was nothing but preconceived assumptions. The results of opsonic treatment of chronic infections were surprising only to men not conversant with their nature. The results like those glowingly reported, have nothing to do with the "opsonic" treatment, but are only an effective, active immunization of the patient against his own bacteria. Even the opsonic curves, taken during the treatment, prove this. After injection the opsonic curve shows a fall (negative phase), to rise again above the initial height or higher; after a few days it begins to grow lower until an injection again drives it higher, perhaps above the highest point reached before. If at this time the treatment is stopped, the curve will return to its former height and stay there. If the treatment is continued for weeks and these variations of the line of the curve do not appear so pronounced any more, the infection is killed. Now, let us compare this behavior of the opsonic curve with that of the antibody curve that begins low at the normally present amount of antibodies in the body. It shows a negative phase at the beginning of the infection; but if the system is not overwhelmed with the intoxica-

tion, commences to rise and reaches its acme about on the twentieth day, that is, the time when reconvalescence is beginning. It remains steady for a long time and only very gradually disappears after months and even years. Here, we know with what substances we have to deal; we know exactly the character of the reaction down to its quantitative proportions. Wright deserves credit for having called to our attention, by practical application, the value of using bacterial material for dealing with chronic infectious processes; it is a crime, scientifically proved, to use it in the acute infections if not in the most early stages, that are hard to diagnose. Enthusiasts in Germany have reported cases of pneumonia submitted to opsonin treatment. They were fortunate in not killing their patients by the treatment alone.

Aside from this statement there is something that must not be forgotten in the opsonin treatment and theory. Anything that pretends to bear scientific character must have those qualities that are the innate nature of science. The methods by which new theories are arrived at must conform with those held as obligatory by science. That is not by any means true of Wright's method. It is the most empirical that can be imagined; there is no control for any step. It is, furthermore, so much subject to the influence of the personal equation of the observer that a uniformity of results is absolutely excluded. Tests have been made, and blood material from different normal individuals given to a man, experienced in opsonic work, to determine the opsonic index. Among the specimens were several from the same person taken at the same time. He reported that the specimens, which were marked only with figures, showed not only an immense discrepancy in the different bloods, but also in different specimens taken from one and the same individual at the same time. A normal opsonic index does not exist, and we have no means to determine what the normal condition should be. Therefore, conclusions from such an index in disease are not justified. The opsonins will continue to be investigated, and it may be that important functions of their activity may be discovered. As yet they are things that we know exist, but of which, up to now, we have no thorough understanding. Their alleged effect in chronic processes, bacterial in origin, is due altogether to other reactions than those of opsonins.

A discussion of the work in protozoic diseases, to be what a discussion should be, would necessitate greater space than this review can attempt to cover. It could not be done without entering in many directions of research that have no reference to the pathology and microbiology considered here. It can only be stated that the progress of the study of animal protozoic and other parasitic diseases has advanced immensely, although the principal questions, as, for instance, that of the relation of host to parasite, or the change of generation in different hosts, have not received much attention, and, therefore, or for other reasons, such as the difficulty of obtaining satisfactory material, or a sufficiently long-lasting opportunity to be able to investigate the subject in the locations where those diseases only can be studied with advantage, the scientific progress of what is usually called a tropical medicine has not been very great. The various

diseases that endanger human life by protozoa, have received the most extensive application of workers. Scientists of England, France and Germany have spent years in the areas where these diseases occurred, and the many institutes for tropical diseases, so-called, in these countries and endowed with hospital facilities, have given splendid opportunities to study the various diseases under the most favorable conditions in cases introduced from the motherlands of those diseases. Hamburg and London have been foremost in this direction. As already stated, the progress of pathology and protozoölogy in all this work has been great; the most important was done by Koch on sleeping sickness, caused by a trypansome (Gambiense). With indefatigable energy he has established the endemological character of this disease and conceived measures by which it can be controlled. The ways of diagnosis and treatment have been immensely improved, so that the outlook for the success against these plagues is very promising. As to malaria, nothing new has developed, except the work of Craig,[54] referred to in last year's review on the clinical influence of a conjugation of the young ring forms of the tertian and the other types of the parasites on the course of the disease. Later papers of Craig have enlarged the effect of this discovery to valuable data useful in the dealing with chronic malaria. As to the biology of the parasite and the specific biologic differences of the various types of it, Plehn,[55] ignoring all the well established experimental results, has again, on merely clinical observation, pronounced the unity in specific character of all three types of the parasite.

The endeavor to find reliable therapeutic procedures for the eliminating of protozoic, mainly trypanosomic infections, has given rise to exceedingly fascinating results in the work of Ehrlich[56] on the relation of certain chemical compounds (stains and arsenic compounds) on the life and biologic changes in the life of trypanosomes. Aside from finding with these investigations, that a resistance, hereditary in character, could be established against certain substances chemically well defined, that this resistance, acting specifically and not influenced by other material similarly toxic but chemically different, the rest of the work is too manifold in character to be referred to in a few words.

The Kala-azer parasite, a near relative of the trypanosomes, has been receiving much attention also, but nothing has developed to throw more light on its biology and parasitism.

As to higher developed parasites, the filariæ, etc., new forms have been discovered, and racial differences established, but on the whole our knowledge has not greatly increased. It is the same with the amœbic intestinal parasites about which only clinical and pathological observations are made. It is a great satisfaction to know that Craig's observations have almost fully confirmed the systemic and biologic difference between the amœba dysenteriæ and the amœba coli so admirably represented by Schaudinn.

The spirochætes come last for the reason that their systematic position is as yet not clear. Although the reviewer is inclined to relate them to the protozoic world, he cannot give any more proof for it than has

been given in many former publications. Certain characters of this group approach very closely to bacteria; others have never been seen in these latter organisms. The protozoic nature is, therefore, not established, and this obtains also for the bacterial interpretation. Further study must show whether they have a developmental character of one of these two classes. That they play a great part pathologically, in our human pathologic conditions is well known; for animal diseases their pathologic activity is just as detrimental. The latter cannot be considered here; of the human parasites, the relapsing fever and the tick fever in Africa and South America, caused by infected ticks, were known for a long time in their etiologic causation due to a spirochæte. The important biologic relations of the parasite and the host have only been established for the spirochæte of the African and American tick fever, not as yet for the Asiatic and European febris recurrens. While the study of these two organisms has at least established their different types, their other biologic behavior has not been interpreted. In none of them do we know as yet whether the transmission to the human organism is simply mechanical or conditioned upon certain developmental changes in the second host.

The spirochæte that above all deserves an extensive and detailed discussion, the spirochæte pallida of syphilis, cannot be dealt with here as it should be, although the reviewer would have been delighted to devote the whole space for his review to this subject. The literature about it is so vast that he has in his reach alone the titles of over 600 publications appearing in the two last years in regard to the etiology of syphilis. What makes it difficult to review this literature is that the results in the overwhelming part of it are absolutely uniform; that the methods, also varying in technic and character, to obtain this uniform result cannot be objected to in any way; and that the conclusions drawn from them are as qualified as any conclusions in the range of our mental capacity can be. We must not forget that this range is limited to the capacity of our mental apparatus, that it is only human, and adapated to the needs of human life; we will never go beyond it. The uniformity of the conclusions as to the etiologic character of the spirochæte of Schaudinn is all that can be said as to the meaning of the immense literature published so far on the subject. As far as our experience goes, there is no doubt about its so-called truth, and the few contradictions made against this conception by men like Sahling, Schultze and Sigel[56, 57, 58, 59], fall flat in view of the uniformity that is expressed in this literature on the syphilis spirochæte. As it is uniform in opinion, it need not be detailed. The spirochæte pallida of Schaudinn, *not* of Schaudinn AND Hoffman!) is established today as firm as any so-called scientific facts. As far as our ability can go, it will be soon possible to make pure cultures of the spirochæte, and to prove positively that their effect on the animal organism is the same as that of the material so far used for transmitting the disease from one organism to the other. The specificity of the spirochæte pallida is, at the end of this year, established, and a new addition made to the progress of keeping human life

in a state that further natural developments will be possible. Whether this is nature's way or not, we cannot say, but we at least sincerely hope it is.

Of infectious diseases due to organisms not known, or of demonstrably ultramicroscopic size, yellow fever has not made any progress beyond what was established before. It might be mentioned as a note, that an isolated report has been made of the finding of a spirochæte in the tissues of one case, demonstrated by the Levediti method. It was published in the Bulletin of the Marine Hospital Service. The negri bodies of hydrophobia have continued to be used as an important diagnostic help; their character is as obscure as before. So far the probability is that they are not parasites, but products of cell changes specific for the disease, like the cytorrhycte forms for variola. The work of Ricketts[60] on the Rocky Mountain tick fever has established the etiologic agent to be ultramicroscopic; its transmission by a definite form of ticks has been experimentally proved by inoculation of animals (monkeys and guinea pigs), and the author has succeeded in cultivating the virus by continuous serial inoculation of guinea pigs. The virus caused the death of the animals in 7 to 12 days; the clinical and anatomic characters are characteristic and analogous to those of the human disease.

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## OPHTHALMOLOGY.

By John Green, Jr., M. D.

The plan of the present review of ophthalmology will depart somewhat from that of its predecessors in that no attempt will be made to cover even imperfectly the literature of the passed twelve months. The writer's aim has been simply to present a synopsis of the general trend of advance in ophthalmology and to indicate the lines along which advance is likely to come in the near future. Such a review is of necessity a reflex of one's personal views as to what has constituted progress, rather than a catalogue of the facts of the twelve months' progress. In brief, therefore, this review will aim to serve as a guide to such readers as may be interested in the general trend of ophthalmic thought at the present time.

*Comparative Ophthalmology.* A notable contribution to the subject of comparative ophthalmology has been made by C. A. Wood whose paper, "The Eyes and Eyesight of Birds with Special Reference to the Appearances of the Fundus Oculi," appeared in *Ophthalmology*, April, 1907. These studies were made in the gardens of the London Zöological Society and from sections of birds' eyes and brains. One cannot do more than allude to the intensely interesting character of this research and to commend the excellence of the author's presentation. His conclusions are, in part, as follows: (1) The highest expression of vision, including the most varied and widest range of accommodation, is found in bird life. (2) Owls possess binocular sight. (3) Every bird possesses a "pecten"—an erectile body composed of vascular trunks probably taking the place of retinal vessels and extending from the optic nerve to the lens and possibly having to do with the mechanism of accommodation. (4) The refraction of most wild birds is simple hypermetropia; of domestic species hypermetropia or myopia, with astigmatism. (5) The post-mortem appearances of birds' eyes are decidedly misleading. (6) The range and rapidity of accommodation is far greater in birds than in man. (7) Several visual areas may coexist in a single fundus thus enabling the bird to obtain the vision best suited to its needs. (8) The color sense of birds is very acute. (9) Posterior lenticulo-capsular opacities and the human persistent hyaloid artery are pectinate remains.

A study of the ocular apparatus as it exists in some invertebrates has been made by Leslie Buchanan. The octopus has a lens and iris as in man, but the main difference is that the bacillary layer is pointed inward and not outward. The clam has a lens which is not adjustable, and the iris is replaced by a ring of pigment surrounding the cornea. The spider possesses no special lens but the shape of the cornea is biconvex. In the caterpillar the eye is a dermic structure, about 1-350 inch in diameter. There is a kidney shaped lens but no well developed retina. In the house fly and the bee the cornea is multiple; each of the thousand or more areas is a biconvex or planoconvex lens. Lying behind each of these lenses is a structure comparable to a retinal cone and from this cone

passes backwards, through a diaphragm of pigment, a single fibre, all the fibres meeting ultimately to form a nerve. The snail has only light perception, possessing only a central lens surrounded by pigmented fibres which serve the purpose of retinal elements, while in the Australian mole and leach the eye merely consists of a few pigmented cells which respond in some way to the stimulus of light.

*Pathology.* That fascinating problem—the pathogenesis of senile cataract—has engaged the attention of a number of workers notably Mlle. Toufesco and Paul Roemer. The latter approaches the question from the standpoint of serum research and his papers deal with the following subjects: (1) The physiologic variations in the osmotic pressure of the intraocular fluids and their relations to the osmotic pressure of the blood serum. (2) The effects of poison on the lens. (3) Experiments concerning sero diagnostic reactions in senile cataract. (4) Researches on the absorption of antibodies by the lens and the permeability of the lens capsule for components of the serum hæmolysins. The idea underlying these investigations is that senile cataract may conceivably be caused by cytotoxins. The paper is extremely technical and does not lend itself to summarization.

A histologic study of the normal healing of wounds after cataract extraction has been contributed by Thomson Henderson. The basis of the study was 32 aphakic eyes in which healing was progressing normally. Among other points Henderson has demonstrated that after a corneoscleral incision, there is a tendency for the corneal flap to override the peripheral scleral lip, which is due to the fact that the corneal lamellæ are released from their normal tension. In a purely corneal incision, agglutination is brought about by a fibrinous exudate, followed later by a proliferation of the surface epithelium and posterior endothelium. When there is much gaping, corneal epithelium may make its way into the anterior chamber and even block the iris angle. The corneal elements play no part until two weeks after the operation when they begin to compress the fibrinous plug. Permanent cicatrization does not take place for two or more months. In scleral incisions there is an ingrowth of episcleral connective tissue and vessels derived from the conjunctival flap. Later these cells are replaced by scleral tissue cells. The resulting cicatrix is broader and more distinct than in corneal sections, which explains the greater postoperative astigmatism of such incisions. The same author, in a study of the histology of iridectomy found that this operation does not disturb the relation of the severed tissue cells either to each other or to their normal surroundings, the severed iris tissue appearing even after years as if cut post-mortem.

The pathology of rupture of Descemet's membrane, as described microscopically by Becker, in 1875, and again by Haab in 1899, has engaged the attention of many workers in ophthalmic pathology, among whom should especially be mentioned, Alt, Wood and Coats. These splits are found in buphthalmos, myopia, glioma retinæ, etc. The ruptures usually run transversely in the periphery of the cornea. If the endothelium gives

way it is entirely regenerated, but however perfect the repair may be the edges of the split are generally visible owing to the heaping up of homogeneous substance at the coiled up ends. In 1906 Erdman produced ruptures of Descemet's membrane in rabbits by electrolizing the aqueous. The interest of workers in ophthalmic bacteriology may be said to have centered in the spirochæta pallida. The present position of this organism in relation to syphilitic affections of the eye is well set forth in a short paper by Sydney Stephenson. It has been shown that the spirochæta pallida can be found in the non-inflamed eyes of fetuses and of infants suffering from congenital syphilis; that inoculation of the eyes of monkeys and rabbits with syphilitic material may produce lesions of the cornea and iris which are like those seen in man affected with ocular syphilis, and lastly, that spirochætes have been demonstrated in syphilitic iridocyclitis and keratomalacia. Stephenson concludes "that in the discovery of Schaudinn's organism we have the strongest possible proof of the syphilitic nature of any given disease of the eye."

*Congenital Anomalies.* Some decidedly novel views with reference to the true nature of congenital buphthalmus have been advanced by Abadie. This author denies that the condition is essentially a glaucoma, but ascribes it to a chorioretinitis which may not be detected owing to the cloudiness of the cornea or to the fact that the lesions are situated too far forward to permit of examination with the ophthalmoscope. Persuaded that chorioretinitis plays the fundamental role, Abadie has discarded surgical methods (irridectomy and sclerotomy) and relies wholly on intramuscular injections of mercury.

*Instruments and Methods.* Reference was made in the review for 1906 to Landolt's paper in which he criticised adversely the design of many ophthalmic instruments as found in the shops. Emphasis was laid especially on the desirability of slight modifications in existing models. All operators will doubtless agree with Beard that the style of fixation forceps in general use is awkward because of the strained position in which the hand is placed. The instrument designed by this author is fashioned after the plan of De Wecker's iris scissors and enables the operator to grasp the globe below the cornea without cramping the hand. The blades of the forceps are set at an oblique angle to the handles, thus permitting the latter to be maintained in the vertical position with the hand of the operator out of the light. A method of tenotomy designed to enable the operator to limit the effect as required is proposed by Todd. He severs a portion of the tendon on one side by an incision at right angles to the muscle and half way through, then makes a similar incision in another place on the opposite side of the muscle situated a short distance longitudinally from the first incision, thus severing the fibres and thereby lengthening the tendon. Ewing has improved upon his forceps for fixation of the lid and control of hemorrhage in the operation of tarsal subsection by the attachment of a flat plate to the posterior arm. The reviewer can bear witness to the great value of this device which should go far toward popularizing the same author's operation for entropion (subsection of the tarsus with the stitching of the posterior flap into the base

of the cut). An instrument designed by Maddox intended for the measurement and enlargement of the fusion power is called the "prism verger." It consists of an adjustable spectacle frame in which two prisms are simultaneously rotated in opposite directions. One of the prisms is reversible in order to effect vertical as well as horizontal separation. It is also adapted for training the muscles by exercise.

A simple method of determining binocular perception of depth has been suggested by Borschka. The patient is asked to approximate the points of two hatpins held at the reading distance up to the distance of 1 mm. A person without binocular perception of depth will not be able to accomplish this task.

A new method of examining entoptically the retinal circulation and fovea has been devised by Fortin. Looking at a mercury vapour lamp through a screen of cobalt gelatine, the retinal capillaries are seen as brilliant convoluted tubes running in all directions. Now and then the lumen of the capillary is seen to be obliterated by small black spherical bodies, either isolated or following one another in succession. These are the red corpuscles. The foveal region is examined by interposing a piece of blue glass. The fovea shows up as a dark horizontal area, surrounded by the bifurcation of the retinal capillaries. The dark area is covered by a number of small brilliant circles close together, giving rise to a mosaic appearance.

*Therapeutics.* The past year has been marked by greatly renewed interest in the diagnostic and therapeutic application of tuberculin to various diseases of the eye. It is becoming increasingly evident that tuberculosis is the etiological factor in many ocular diseases of the anterior and posterior segments. The application of specific tests has now rendered a diagnosis in many heretofore obscure conditions easy and certain. Very recently v. Pirquet found that in tuberculous subjects vaccination of the skin with tuberculin produces a local reaction marked by redness, swelling and papulation coming on in from twenty-four to forty-eight hours. The papule, which is the diagnostic element of the reaction, is later replaced by a pigment spot. This "cutireaction" appears to be specific in that it occurs only in tuberculous subjects. Almost simultaneously with v. Pirquet's paper appeared the announcement of Calmette that tuberculosis may be diagnosed by placing in the conjunctival sac a single drop of a one per cent aqueous solution of dried tuberculin. In healthy subjects no reaction whatever follows. In tuberculous individuals on the contrary, the so-called ophthalmo reaction occurs. Thus, three to six hours after the tuberculin has been used, the semilunar fold and caruncle become reddened, the eye presenting later the signs of an acute infective conjunctivitis. The reaction disappears in from 18 to 36 hours. The patient's general state remains unaffected. Calmette's results, in so far as they relate to the diagnosis of tuberculosis other than ocular, have been confirmed by a large number of observers. The application of the test in various eye diseases of obscure etiology has now been made in sufficient number to warrant the assertion that this reaction

will prove of inestimable value in the diagnosis of ocular tuberculosis. A comprehensive paper summarizing the results so far obtained is that of Sydney Stephenson. (*Ophthalmoscope,* December, 1907). From the therapeutic point of view Bull's paper on the value of tuberculin, T. R. in ocular tuberculosis indicates what large measure of success may be obtained by the judicious use of this agent in properly selected cases. One point in this connection that is in need of further elucidation is the question of dosage. On this point great diversity of opinion still obtains. Some workers rely upon the large doses of the early period of tuberculin therapy, while others, notably the followers of Sir Almoth Wright, insist (and probably rightly) that the opsonic index furnishes the only reliable guide to the proper dosage. Based on the findings of this method it would appear that the therapeutic dose should begin with 1-2000 mgm. and never exceed 1-500 of a mgm. The present year has witnessed a decided reaction in favor of that old ophthalmic standby—silver nitrate—as against the host of organic silver preparations which of late years have occupied so prominent a place in ophthalmic therapy. Argyrol in particular has come in for much unfavorable comment and is now regarded rather as a valuable adjuvant to silver nitrate than as an agent to be used exclusively in severe infections of the conjunctiva and cornea. Great caution must be observed in using argyrol for purposes of irrigation in suppurative conditions of the lacrimal sac, a number of cases now being on record in which argyrol, escaping into the cellular tissue of the lid, caused a hideous and almost ineradicable stain. The enthusiasm with reference to dionin has suffered no abatement, rather have the indications for its employment been increased. In certain cases, at least, its efficacy is enhanced by using it, not in solution, but as a powder directly to the conjunctiva.

Artificial congestion (Bier's method) to disease of the eye (whether by constricting the neck or by the employment of a suction apparatus fitted to the forehead and cheek) has not yielded results comparable to those obtained in general surgery. Nevertheless, certain cases of chorioditis and ulcer of the cornea with hypopyon have been decidedly benefited by the application of this method.

The application of boric acid powder as an exclusive method in the treatment of trachoma has been strongly recommended by a number of observers. Bordley briskly massages the cocainized conjunctiva with a cotton-wound applicator dipped in the powder, continuing this treatment until the conjunctiva is smooth. Noyes, however, prefers the application of the powder without massage. Other writers ascribe a special efficacy to massage with a combination of protargol and boric acid powder.

In the treatment of hypopyon, a decidedly novel suggestion comes from Rollet and Moreau. The cornea is transfixed by a Graefe knife passing through the purulent mass, the counter puncture is enlarged by raising the handle of the knife and the instrument is withdrawn without cutting the remaining bridge of cornea. A horse hair 5 cm. in length

is passed from entrance to exit, the ends extending 2 cm. beyond the cornea. By the following day the purulent mass will have completely disappeared.

*Operations.* A perusal of the more recent literature on cataract extraction indicates the wide acceptance of the combined operation as affording in the hands of the average operator the greatest possible chance of success. There is, generally speaking, a noteworthy unanimity of opinion with respect to the other details of the operation, e. g., the placing of the incision, type of capsulotomy, etc. The great value of the conjunctival flap in the promotion of early repair and the consequent prevention of infection is now universally recognized. The Indian operation—expression of the lens in the capsule—has failed to gain any enthusiastic adherent, although further reports emanating from Major Smith's clinic are not one whit less enthusiastic. American and Continental operators have been deterred from practicing this operation for fear of vitreous losses. This accident is especially frequent when the operation is performed by an inexperienced operator. The proper procedure to be employed in any given case of secondary cataract is well set forth by Callan, whose views in all respect are thoroughly sound. Diaphanous membranes are the only ones suitable for division by the knife needle. Firm bands extending across the pupil are best dealt with by a narrow Graefe knife. Dense membranes with adherent iris should always be managed by the De Wicker scissors. Under no circumstances should an operation which involves tearing, as Bowman's operation with two needles, ever be performed.

It has long been observed that the occurrence of a cystoid scar following iridectomy for glaucoma has had a distinctly favorable influence on the course of the disease. To this end some operators have advocated the deliberate incarceration of the pillars of the coloboma in the wound. Recently Lagrange, by excising a semilune of sclera from the anterior lip of the section, and Herbert by cutting off a scleral wedge, have sought to secure a true filtering scar without the obvious drawbacks of the method to which allusion has just been made. The position of Heine's cyclodialysis (the establishment of a communication between the suprachoroidal space and the anterior chamber without removal of the iris) in the surgery of glaucoma is still far from being definitely fixed. The subject of corneal grafting has received a decided impetus by reason of the success of Zirm in securing excellent and lasting vision in a leukomatous eye by implanting a graft taken from a freshly enucleated eye. The question is also dealt with by O'Meara, who, however, is by no means optimistic as to the future of this operation. In order to diminish the amount of light passing through the sclera in albinos, Komoto proposed and carried out the injection of india ink subconjunctivally and into the tissues of the lid. The gain in comfort and vision was very considerable, but the deformity was so great as to preclude the adoption of the method for general use.

*Traumatisms.* A class of injuries hitherto slighted in the literature has come in for considerable comment in the past year. It has long

been recognized by ophthalmologists that injuries to infant's eyes may occur during the passage of the head through maternal passages. It has been generally believed that such injuries are rare, and due, in a vast majority of instances, to the improper application of obstetrical forceps. Especially within the last two years have ophthalmic surgeons come to realize that such injuries occur with much greater frequency than was formerly supposed and that in many instances unskilful use of forceps could be positively excluded. Recent statistics indicate that slight injuries to the eyes resulting in opacities of the cornea, subconjunctival hemorrhages, and hyphema are by no means infrequent. The more severe ocular injuries thus produced are: Traumatic exophthalmus, fracture of the orbital wall, leukoma of the cornea, irido-dialysis, paralysis of one or more of the ocular muscles, atrophy of the optic nerve, lacerations of the lids, and ectropion. In a few cases both globes have been completely crushed. The reviewer has gained the impression that obstetricians are not sufficiently alive to the possibilities of ocular injury occurring during difficult instrumental deliveries.

*Sympathetic Disease.* The terms "Sympathetic Ophthalmitis" ("Transferred Ophthalmitis" of Oliver) and "Sympathetic Irritation" are not applicable to the description of a condition described by Fergus as "Sympathetic Degeneration." This type is non-inflammatory, it does not lead to blindness, and its chief characteristic is a peripheral tolerably concentric contraction of the field of vision and somewhat diminished central visual acuity. Fergus is convinced that severe injury to one eye is usually followed by a certain amount of sympathetic degeneration in the other.

*Glaucoma.* The problem of the pathogenesis of glaucoma has been attacked by Thomson Henderson whose investigations have led to the conclusion "that the underlying predisposing and causal factor of glaucoma exists in a primary obstruction of the pectinate ligament. This occlusion is brought about by a sclerosis of the fibrous structure composing the filtration area, which results in first, a diminution, and finally, a complete obstruction of the outflow through that channel." The author points out that the connective tissue cells of the pectinate ligament are in the young eye scarcely to be differentiated from the endothelial cells. They gradually undergo fibrosis and it is in this histological difference between the structure of the pectinate ligament in the eye of a child and of an adult that the key to the pathogenesis of primary glaucoma lies. Thus theory seems to offer adequate explanation for the various types of glaucoma. Attention is directed to the fact that the iris is an absorbing surface, accessory to but no less important than the pectinate ligament itself. The efficacy of myotics is due to their contraction of the pupil, thus opening out the crypts on the iris surface, thereby allowing the aqueous to find a way out. Iridectomy opens up a permanent channel for the intraocular fluids to drain away, a channel which will not be influenced by the state of the pupil and which will always be effective if the operation is performed before the iris tissue becomes atrophined and degenerated.

*Amblyopia.* Apart from hysteria, total temporary blindness in one or both eyes is of very rare occurrence. In such cases the blindness has been of some duration, varying from hours to days. Under the title "Recurring Transitory Blindness" Jacqueau reports four cases of recurrent blindness of very short duration. He believes this condition should be classed as a type of ophthalmic migrane, which it is generally agreed, is of circulatory origin. In the cases reported, the trouble was not peripheral as ophthalmoscopic evidence of circulatory disturbance in the retina was always wanting. The prognosis should be guarded, as cases are on record where the symptoms were followed by death from cerebral tumor or permanent loss of vision from optic neuritis and atrophy.

*Refraction and Accommodation.* Certain failures in refraction work are difficult to explain and the designation of any source of error hitherto overlooked is important. Such a source of error has been pointed out by Byers in the inaccuracies of test lenses. Recently this author had occasion to examine the lenses of English manufacturers in a test case and found a large number of the spheres 1-2 mm. off center and about a dozen cylinders off axis. A case of American manufacture showed even worse conditions.

The question of accommodation in juvenile aphakic eyes has been investigated by Fuerst whose material consisted of 8 cases in which a varied amount of accommodation existed after absorption or extraction of the lens in young persons. In some cases the entire amount of the high grade hypermatropia of the aphakic eye (12 to 13 D) was compensated for. The mechanism of accommodation is thought to be due to the pressure of the orbicular and the external muscles. The internal muscles take no part in its production.

The important question of accommodation after middle life is well discussed by Jackson who concludes (1) that averages should be forgotten in prescribing lenses for an individual patient; (2) that the variations in accommodation after fifty are as wide between individuals of the same age as between the averages of a different age; (3) that in some persons accommodations persist to extreme old age and must have taken into account in the correction of the presbyopia or the determination of the ametropia present.

*Lacrimal Apparatus.* The importance of rectifying intranasal abnormalities in obstructive and suppurative disease of the lacrimal apparatus is yearly becoming more widely recognized. An instructive paper by Meyer deals with the mechanical and reflex changes in the nose upon which epiphora depends. The mechanical changes include hypertrophies, formation of crusts, polyps, etc. Special stress is laid upon the deformation of the inferior turbinate which is closely attached to the concave wall of the lower meatus of the nose. This passage easily becomes obstructed by any swelling of the mucous membrane. To avoid the evil effect on respiration of removal of the inferior turbinate, the author recommends the grasping of the lower end of the bone with a

flat blunt forceps, thus breaking it. It is then bent towards the septum where it remains in its new position.

*Conjunctiva.* The type and severity of conjunctival inflammations are not reliable criteria of their bacteriological causes. This fact is strikingly brought out by McKee, who records three cases of severe purulent conjunctivitis due respectively to the gonococcus, the Koch-Weeks bacillus and the diplobacillus of Morax-Acenfeld. Metastatic affections of the conjunctiva, more especially the metastatic conjunctivitis occurring in gonorrhœa, have been the subjects of several papers. A retrotarsal inflammation of the conjunctiva accompanied by photophobia and asthenopia is ascribed by Elliott to the glare of the subtropical sun of India. The condition is most frequently seen in people not natives of India. Under the title "Acute follicular conjunctivitis with glandular involvement" Beal describes a form of conjunctivitis characterized by the presence of follicles in the palpebral conjunctiva and in the cul-de-sac. The onset of the disease is acute and its course rapid. Recovery is complete without cicatricial traces. The preauricular and at times the submaxillary gland are enlarged.

*Sclera.* The etiology of scleritis and anterior sclerokeratitis has always been a vexed question. It has long been the fashion to ascribe these diseases to rheumatism and syphilis. A recent paper by Verhoeff indicates that in most cases the disease is a localized tuberculosis. In 13 unselected cases Verhoeff obtained a positive general reaction to tuberculin injections in all and a local reaction in 9. Tuberculin therapeutically applied was invariably efficient in shortening the course of the disease.

*Lens.* Purtscher has drawn attention to a form of cataract practically ignored in the literature of diseases of the lens. He relates 4 cases—two brothers, their sister, and a man who was no relation. In all the cases the cataracts appeared about the age of 20. They were either cortical or more commonly total; the sclerotic was bluish white and thin; the anterior chamber was very deep; the iris was of a dirty gray brown color and showed none of the usual trabecular structure; an irregular ectropion of the uvea was usually present; the pupils were sometimes contracted, generally unequally, acting badly to light, to accommodation and atropine. Iridodonesis was marked and the vitreous was so fluid as to escape with the aqueous when the anterior chamber was opened. In all cases there was a strong predisposition to glaucoma, cyclitis and detachment of the retina on any operative interference.

That the opacity of incipient cataract does, in instances not altogether rare, regain transparency can no longer be gainsaid. This fact necessarily invalidates to some extent the conclusions of those who ascribe curative properties to various local applications in the treatment of incipient cataracts.

Nevertheless evidence is yearly accumulating that something may be accomplished in a medical way in these cases. Potassium iodide injected subconjunctivally has yielded in the hands of certain observers continuously gratifying results. Very recently subconjunctival injections

of dionin have been proposed by Bernstein in the treatment of incipient lamellæ and nuclear cataract.

*Vitreous.* Malignant recurrent hemorrhage of the vitreous is a condition so hopeless that any therapeutic suggestion is worthy of consideration. G. S. Derby reports a case in which vision rapidly failed to 3-60 in one eye and perception of light in the other after failure of mercury and iodide. Rapid improvement in the ophthalmoscopic picture and vision followed ligation of the common carotoid artery. Unfortunately, the hemorrhage recurred and sight was lost. In 2 cases cited from the literature the effect of ligation was permanently beneficial.

*Retina.* Retinal phlebitis is a subject entirely neglected in works on the diseases of the fundus of the eye. Rollet believes that such cases are (incorrectly) diagnostic neuro-retinitis. The ophthalmoscopic picture is as follows: Veiling of the disc border, infiltration of the retina, engorgement and tortuosity of the retinal veins, pallid and shrunken arteries and small retinal hemorrhages.

*Optic Nerve.* Removal of intracranial tumors has frequently a most happy effect on the associated optic neuritis or choked disk, as shown by the subsidence of papillary swelling and the restoration of vision. Of late years cranial surgery has especially concerned itself with the operation of palliative trephining or cerebral decompression for the relief of intracranial pressure in cases where localization of the growth was impossible. This operation, while prolonging life and relieving suffering, has also been the direct means of terminating the destructive process in the optic nerve head. The most favorable cases from the ophthalmologist's point of view are those in which operation is performed prior to the onset of atrophy. In such cases the nerve head may resume a normal appearance and vision be restored. The whole subject has recently been thoroughly covered by De Schweinitz.

*Muscles.* Experiments to determine the smallest possible muscular movement of the eye are described by Veress. By looking successively at vertical lines placed 1 mm. from the eye he determined the minimum distance through which the eye could pass with precision from one line to another. This he found to be 3 mm. The smallest contraction of the muscles corresponding to this movement was found to be 0.0355 mm. or 1-1126 of the total length of the muscles concerned.

*Orbit.* A rare path of infection of an orbital abscess is described by Barck. A small wound of the temple reaching to the bone was followed by swelling of the upper lid and exophthalmus. A probe passed toward the bone gave the impression of a fracture. At operation it was found that the roughness felt by the probe was the edge of a large emissarium. A drain was introduced into the wound and the following day pus appeared. The ocular signs abated but 6 weeks later there was fever, pain and stiffness of the neck with convergent squint from paresis of both externi. Final recovery. An examination of a number of skulls revealed an emissarium not mentioned in the text books between 15 and 25 mm. Above the outer edge of the supraorbital margin, which leads downward into the diploe, and in the outer portion of the

roof of the orbit numerous small foramina. Barck concludes that the path of infection was through the emissarium into the diploe, thence through these foramina into the orbital tissue.

*Eye and Nose.* There has been no diminution in the interest and attention paid by ophthalmologists to the relationship of sinus and ocular disease. Birch-Hirschfeld in a paper entitled "Eye Symptoms in Disease of the Accessory Sinuses of the Nose," confines himself largely to a consideration of the affections of the optic nerve induced by disease or tumor of the neighboring sinuses. The paper is a very valuable one and the main points are thus summed up: (1) Inflammatory affections and tumors of the posterior accessory sinuses may attack the optic nerve and orbit and give rise at an early stage to more or less severe deterioration of sight. (2) This interference may take the form of a central scotoma, the peripheral field remaining intact. (3) Diagnosis is difficult but one may be assisted by the onset of the above symptoms. (4) In the differential diagnosis between a toxic neuritis and one caused by disease of the sinuses important points would be (a) unilateral occurrence and (b) the passing of a relative into an absolute central scotoma. (5) The anatomical basis of the scotoma is an isolated affection of the papillo-macular bundle behind the point of entrance of the perforating vessels. It consists in edema of the nerve, swelling and proliferation of the glia cells and marked destruction of the nerve fibres. Venous stasis at a certain specific area is the probable occasion of its occurrence, aided perhaps by a toxic influence upon the nerve fibres.

*Relations With Medicine.* The role of constitutional diseases in the etiology of choroiditis has been emphasized by Bull and De Schweinitz. The former describes a distinct type occurring in malaria; small patches of yellow exudation fairly circular in form only slightly elevated above the surface, occur all over the fundus and show no sign of coalescence. This type is very often accompanied by general uveitis with punctate opacities of the vitreous; the patches of choroidal exudation may be hidden and only become visible when the vitreous clears. In this type central vision may remain good despite the inflammatory process in the fundus provided no vitreous complications are present.

The ocular symptoms in cerebro-spinal meningitis are discussed by Ballantyne on the basis of a study of 73 cases. The symptoms occur in great variety—squint, retraction of the lids, changes in the size and reaction of the pupil, variation in vision, from day to day or even in the course of a single examination. Conjunctival hemorrhages and herpes of the lid are rather frequent at the onset. The uveal tract is not involved. Especially noteworthy is the infrequency of paralytic squint and of optic neuritis and the frequency of spasmodic squint in disassociated movements. The presence of lid retraction, corneal complication, absence of the pupil reflex, nystagmus, lid winking combined with jerky movements of the eye, and optic neuritis are grave signs and warrant a bad prognosis. Coakley has noted as a terminal symptom of hydrophobia, pin point contraction of the pupil, resisting the local and hypodermic use of atropin, and changing to medium dilatation immediately

before death. The cornea and conjunctiva are analgesic in almost all cases and choked disc is of frequent occurrence.

*Miscellaneous.* Instructors of the blind have long felt that bodily exercise, spontaneous play and physical self reliance were features of training sadly neglected. The experiences of the Overbrook Institution in providing outdoor play grounds indicates that physical culture is perfectly feasible for those totally, as well as for those partially blind. At Overbrook the layout of the grounds is indicated by the physical needs of the pupil. Everywhere there are straight lines and rectangles. Trees are planted in avenues dividing the different play grounds. In front of every row there are narrow walls of brick enclosing the play grounds on all sides, and the children know that there is danger ahead as soon as their feet touch the hard walk. In the gymnasium the wooden floor is framed with a cement walk 7 feet wide. When the feet or roller skate strike it the feel and sound are different. Certain exercises are required from all. At the Kentucky Institute for the Education of the Blind a football team has been in operation for three years. All members of the team are blind, though three of the back field have light perception. The game is modified to some extent; goal kicking is abolished and the opponents cry "pass" when the ball is put into play. The players know who has the ball by the way his feet strike the ground. They do not try to catch the ball but wait until it strikes the ground; then spring for it guided by the faint swish it makes as it passes through the air. Last fall they defeated seeing teams a few times. A magazine in raised letters that can be read with the fingers, entitled "The Ziegler Magazine for the Blind," has recently made its appearance. Every blind person in America who has not already sent his name is requested to do so at once, as the new magazine is to be sent free to every blind man or woman in the United States who wants it.

An intensely interesting article by Stratton on "Railway Disasters at Night" lays emphasis on the psychological need of revising railway signals. He deplores the necessity under the present system of the alternation every night and morning between two wholly different kind of signals, for what is needed is absolute simplicity. The signals should pierce the mind, should thrust their meaning home in the most direct and unerring way. A symbol should bear only a single meaning and the given meaning should be conveyed by an unchanging sign. A system in which an idea is communicated now by one sign and now by another is not entirely flawless. He proposes to do away with color as a means of the signaling and to use throughout the 24 hours the signal which is now employed only by day. He would retain the shape of the semaphore vane and at night this could readily be made luminous. As at night a city's lights are arranged in lines and letters to catch the attention so here the signal could become a fiery arm pointing upward or downward or midway between these directions.

## OBSTETRICS AND GYNECOLOGY.

By Hugo Ehrenfest, M. D.

For the past few years these reviews have taken up the literature on pubiotomy—the most widely discussed subject—as the first subject for consideration. Conditions seem practically unchanged. "Operations for the purpose of widening the contracted pelvis" was the one of the two topics placed for discussion before this year's meeting of the German Gynecological Society. In the customary manner opposing views were presented by Zweifel and Doederlein, the two official "Referenten." It is needless to say that the former spoke in favor of symphysiotomy, while the latter extolled pubiotomy, or as this operation according to Doederlein more properly must be called, hebosteotomy. A perusal of the proceedings of the Congress, as reported in the Zentralbl. f. Gyn. No. 24, leaves little doubt that the majority of German obstetricians prefer hebosteotomy to symphysiotomy, and make extensive use of this new operation. According to statistics collected by Doederlein the subcutaneous operation, i. e., the one almost generally adopted, has been performed on 217 patients with a mortality of 4 per cent. Of those patients, who died of infection, all had fever at the time of operation. In infected cases the mortality of the operation is 12.5 per cent, and Doederlein, therefore, concludes that this operation is contraindicated in infected cases, in which perforation must be given preference. In the subsequent discussion many speakers recorded the results of very extensive personal experience and practically all concurred in the fact that hebosteotomy is a very useful operation, or as Bumm said: The introduction of hebosteotomy in the therapy of contracted pelves must be regarded a most noteworthy simplification of our methods. It may be mentioned in this connection that Sellheim, to whom we owe many most ingenious devices for the practical teaching of obstetrics, presented at this Congress a paper on the feasibility of practicing pubiotomy on sheep in a slaughter house.

As already mentioned, the subcutaneous method of Doederlein is the one almost generally accepted. Therefore, comparatively little of importance has been contributed concerning the technique or indications of this operation, or the after-treatment of the patients. In reference to this last point it may be emphasized that according to Doederlein complicated bandages of adhesive straps or plaster of Paris are unnecessary. As a rule the manyheaded flannel binder is employed, but Van de Velde even suggests to leave every bandage off, since this practice favors the formation of a thick callus, which may result in a permanent enlargement of the pelvis. This latter issue again is frequently discussed in the literature of the past year. Truzzi (Zentralbl. f. Gyn.) enumerates the different methods devised for this purpose and refers to the one invented by him which of late again has been described by Wendeler. It consists in the temporary insertion of a foreign body (decalcified bone,

ivory, metal, etc.) between the cut ends of the pubic bone until a broad callus has formed. This permanent enlargement of the pelvis is the one chief argument in the friendly war between symphysiotomists and pubiotomists. Baisch tried to settle the question by apparently proving from statistics, that the assumption of such a permanent enlargement is erroneous for the one operation as well as for the other, as long as the healing process is perfect. But it is always a difficult task to settle such problems simply by means of statistics. By interpreting the very same figures used by Baisch in a different way, Zweifel attempts to prove that Baisch is all wrong, and Thies, who was able to re-examine 43 patients, on whom symphysiotomy has been performed, thinks that there cannot be the slightest doubt concerning the fact that symphysiotomy at times causes the permanent enlargement of the pelvis, just as it has been claimed for pubiotomy by Van de Velde and others.

Decidedly interesting is an experiment of Gauss with a symphysiotomy performed during pregnancy. He reasoned as follows: The greatest danger of both symphysiotomy and hebosteotomy lies in the possibility that an extensive laceration of the soft tissues during the passage of the fetus may lead to a direct communication of the genital canal with the wound of the operation. Since the callus, as is proved, for some time keeps a pronounced elasticity, it seemed advisable to perform the symphysiotomy a few weeks before full term, so that the wound at the time of labor would be healed. He successfully carried out this plan in one instance.

Two cases of formation of a hernia subsequent to pubiotomy are now on record, but the real danger of the operation lies in the injuries of the bladder. Many of these have been described, but it seems that in all, or almost all cases, these injuries have healed spontaneously. It is obvious that the improvement of the technique of the individual operator is the best and almost secure safeguard against this very undesirable complication of the operation. This is almost convincingly shown in a paper by Kannegiesser in which he compares the results of a second series of 30 pubiotomies of Leopold's clinic in Dresden with those of the first series comprising 21 cases. There was not one maternal death in the total number of operations, but in the second series even all the 30 children had been saved.

Outside of Germany we can observe an equally friendly and almost enthusiastic attitude towards this operation on the part of Italian, French and Russian obstetricians. Even conservative England falls into line. Gibson (in the Jour. o. Ob. Brit. Emp.) who has seen 12 pubiotomies in Dresden and himself has performed three, writes: The enthusiasm with which the operation now is taken up, and the fact that the maternal mortality is only about 3 per cent and the excellence of the after results, seem to prove that pubiotomy is one of the greatest discoveries of modern obstetrics.

E. Hastings Tweedy, the Master of the Rotunda Hospital (Dublin) encountered a very serious hemorrhage in his first pubiotomy, performed on a not very suitable case, but was able to conclude the report

of this experience with the statement that since writing it he has performed two other successful operations "without encountering any of the accidents or complications met with in the first case."

In marked contrast to the extensive use of this operation in Europe, American obstetricians remain rather indifferent. Fry (Surg. Gyn. & Obst.) was able to collect records of 20 pubiotomies made by 11 different American operators, among them Williams with seven cases. Fry performed the operation four times. Of these 20 patients 4 died, i. e., maternal mortality of 20 per cent, a fact which certainly seems discouraging. But very correctly Fry emphasizes that in these cases death was not directly attributable to the operation, but to a prolonged labor, and to infection caused by the fruitless efforts to deliver by means of the high forceps. In the 12 operations, in which no attempt of artificial delivery had preceded pubiotomy, there was no death. This very fact, in my opinion, explains the difference in the attitude of American and foreign obstetricians. Fry thinks that pubiotomy in America will obtain only a limited field of usefulness on account of the unsatisfactory convalescence. "While satisfactory as operation, difficulties are encountered in the after-treatment which are little, if any, less than those which brought symphysiotomy in disrepute." This conclusion seems to me not acceptable, because these same conditions would have prevented the present general acceptance of pubiotomy by so many foreign obstetricians who had refused symphysiotomy. As pointed out by Fry, entirely satisfactory results are obtained only with primary operations, that is, in cases in which hebosteotomy is the first and only operative interference during labor. These cases, for obvious reasons, are rare in the hands of the American obstetrician. Contracted pelves are comparatively most common among the poor immigrants, who, as a rule, at first fall into the hands of midwives and rarely will have escaped fruitless attempts with the forceps before they are seen by the specialist. But in Europe it is just this class of patients which fills the wards of the immense maternities and furnishes the expert obstetrician in charge of the hospital with ample material on which to develop the technique and indications of such ingenious operations as hebosteotomy.

There is possibly still another reason for this apparent indifference of the American obstetrician towards this operation, namely his remarkable admiration of Cesarian section—peculiarly enough largely based upon the excellent results obtained with this operation by European operators. The suggestion to use Cesarian section in the therapy even of placenta previa originated from an expert American surgeon, who told the writer of these lines that this idea suddenly entered his mind when he looked at the dirty hands of the obstetrician who was about ready to perform a version on that anemic patient. A leading German obstetrician has pronounced this method of dealing with placenta previa a blunder which soon will be forgotten even in America. He has erred. In a recent article Lapthorn Smith says: "Cesarian section would save all the mothers and almost all the children who now die from eclampsia, placenta previa

and contracted pelvis. If done early it is a much safer operation than *accouchement forcé,* symphysiotomy or pubiotomy."

Reynolds, during the past year in several interesting articles, makes the claim that the women ill-equipped to stand the strain of pregnancy and labor do well under the primary Cesarian section and "for them in case of doubt the section should be chosen; these women in especial should never be subjected to the combination of labor and a peritoneal operation." And Reynolds classes among these ill-equipped e. g. also the "neurasthenic women, with little nervous endurance or capacity of bearing pain, with poor muscles, heart muscle, and lung capacity, and with ill-trained and usually deficient eliminative system, etc."

There cannot be any doubt that the relative indications for Cesarian section are gradually becoming wider, and rightly so, because the dangers of the operation are diminishing proportionately with the improvement of the obstetric knowledge of the general practitioner who handles the majority of these cases before they reach the specialist. One must not be surprised to find in recent literature cases in which Cesarian section was performed on account of extensive varicosities of the labia (Brunet), or of a vesico-vaginal fistula, or as in a case of Piispanen, because in five preceding pregnancies the fetus had died with the beginning of labor.

It seems, however, doubtful whether at present such a sudden expanse of the indications is justifiable as to include among the cases suitable for this operation prolapse of the cord (as quoted from literature by De Lee) or a certain class of neurasthenics as suggested by Reynolds. Mortality figures alone are entirely insufficient as a basis for alluring theoretical deductions. It seems unfair to pronounce and count every woman as well and cured who has not died as the result of a Cesarian section. Scars in both the abdominal and uterine wall are not entirely negligible quantities. Post-operative hernias still do occur, and a woman with a laparotomy scar, almost as a rule, shows some impairment of her general health or, at least, working capacity. Rupture of the uterine wall during a subsequent pregnancy is an occurrence of more than extreme rarity and should not be left out of the discussion of this problem. About a dozen well authenticated cases of this unfortunate sequela of Cesarian section so far has been recorded in literature.

"Cesarian section in the interest of the fetus" is a common phrase in modern obstetric writings. During the last few years much has been written in favor of the life of the child, which, as is claimed, has been valued too little by the conservative old time obstetrician. Of course, asepsis, improvement of old and the discovery of new obstetric operations have justified a more active therapy in abnormal labor with a gradual betterment of fetal mortality. This "interest in the fetal life," however, today is too extensively used as a mere pretext for a deplorable obstetric polypragmasia.

Rosenfeld has shown that too many obstetric operations are performed and he is supported in his claim by Hegar who demonstrates that at present the mortality resulting from the increased number of ob-

stetric operations does almost counterbalance the gain made by the introduction of asepsis into obstetric practice. And that the effect of the present surgical era of obstetrics has not done so far, and does not promise in the near future to do very much for the fetus without unduly increasing the danger to the mother, is clearly demonstrated in a very instructive paper by Hofmeier (Zeitschr. f. Geb. vol. 59).

A new suggestion has been made of late which furnishes the obstetrician with still another indication for operative interference. The fact seems positively established that in certain instances pregnancy is prolonged. The result is an abnormally large fetus which may cause difficulties during its expulsion and in this way distinct danger to both the mother and the fetus itself. From France (Bouchecourt), Italy (Bossi), England (McKerron), America (De Lee, Allen), etc., simultaneously comes the advice to interrupt pregnancy by artificial means at its normal end. Theoretically no objection can be raised against such a suggestion, in practice one will encounter the one difficulty, that we do not possess a single reliable method of ascertaining the fact that a pregnancy has reached its normal end. Whether methods, which will have to be resorted to in an effort to bring on labor pains, will not increase maternal mortality, or at least morbidity to such an extent as to wipe out the expected benefit, is a question which will have to be decided at a later date.

There is another point which in my belief is not properly taken into consideration by those who argue in favor of a more liberal use of forceps or Cesarian section for the purpose of shortening the sufferings of labor and thus reducing their harmful effect on the mother. I am referring to recent, more or less successful attempts to relieve labor pain. It seems that medullary anesthesia for this purpose is losing in favor, indeed seems practically to have been given up. In the center of interest stands a combination of morphin with scopolamin, introduced as a general anesthetic for surgical operations by Schneiderlein in 1900. About three years later Steinbuechel first made systematic investigations concerning its value in obstetric practice. Since that time many encouraging reports have appeared, among them probably as the most important the paper of Gauss, in which he details the results obtained in 1000 labor cases in the maternity of the University of Freiburg. He considers the half-narcosis (Daemmerschlaf) resulting from the use of a certain dose of morphin-scopolamin "a narcosis absolutely free of danger for either mother or child." From other sources reports have appeared which sound less favorable, indeed, in a few cases (surgical and none of them obstetrical) patients have died after this form of anesthesia. These unfortunate occurrences largely, if not entirely, have been caused by the use of too large doses of these drugs. With the use of small doses in obstetric practice, simply to relieve labor pain, this anesthesia seems free of danger to the mother. The great variations in the results of the different investigators, with total failures in many instances, today is satisfactorily explained by two facts: (1) The various preparations placed on the market as scopolamin (which undoubtedly is identical with hyoscin), vary greatly in their value, i. e. in their physiologic action. The most reliable preparations of this alkaloid are made by Merck and

by Boehringer, according to an article in the Jour. Am. Med. Assoc. (Dec. 21, 1907, p. 2103), a careful perusal of which is strongly recommended to anybody interested in scopolamin. (2) Scopolamin in solution deteriorates rapidly. Newell has found that the solution does hardly keep longer than four days.

Gauss proceeds as follows: Preliminary hypodermic injection of 0.00045 to 0.0006 gram of scopolamin hydrobromate (Merck) with 0.01 gram morphia muriate. The full reaction of this injection should be noticeable within three quarters of an hour. If it fails to appear, another injection of 0.00015 to 0.0003 gram of scopolamin without morphia is given. The effect of this injection, as a rule, becomes evident within 15 to 30 minutes. After two to four hours another dose may become necessary in which the second injection is repeated. If the patient seems to be arousing about 0.005 gram of morphia may be added. This medication can be continued, according to the positive assurance of the author, even for several days. By a careful dosage he attempts to keep the parturient woman in a semi-conscious condition in which she indicates the acute pain of a uterine contraction by slight moaning, but is still able to give rational answers to questions, dozes off between pains, and after completion of labor finally wakes up without any recollection of the occurrences. Newell prepares at least every fourth day a solution containing 1-10 grain of Merck's scopolamin hydrobromate and 2½ grains of morphia sulphate. "As soon as labor became active, practically when contractions occurred at five-minute intervals, an initial dose, containing 1-150 grain of scopolamin and 1-6 grain of morphin was given hypodermically. This was repeated at the end of from one to two hours, unless the patient showed marked reaction to the initial dose. In no case was the dose repeated after the cervix became two-thirds dilated." As already stated the results of Gauss, Newell and many others were very satisfactory, but it must be mentioned that e. g. Hocheisen or Steffen consider this anesthesia as not entirely free of possible harm to both mother and child. The best method of the most appropriate application of this latest form of obstetric anesthesia has as yet not been definitely evolved, but the fact seems established that morphin-scopolamin in many cases can be employed effectively and without noteworthy risk, if a pure and reliable preparation is used, and if too large doses are carefully avoided.

Interesting are recent attempts to introduce into up-to-date obstetric practice the old, and among savage people still popular custom of leaving the bed a few hours after childbirth. Several years ago experiments have been made with such a procedure by Kuestner. At the last congress of the German Gynecological Society Gauss reported results obtained during the past one year and a half in the clinic of Professor Kroenig "Anemia, weakness, heart failure, varicosities, existing or threatening infections were considered strict indications, to urge the patients to leave the bed as early as possible; healthy puerperæ were permitted to decide for themselves when to get up." Of the 1000 women delivered during these 18 months, 60 per cent left the bed before the fifth and 40 per cent before the third day. No ill effects were observed. In fact, those who

got up early felt better than the others. Spontaneous urination and defecation were facilitated. The author lays stress upon the fact that this early rising apparently hastened the appearance of milk. Involution of abdominal walls and genital organs occurred in a most satisfactory manner. The "early risers" showed a smaller percentage of fever cases and of retroflexion. Kroenig in an article in the Deutsche Med. Wochenschrift states that he permits patients to leave the bed, whenever possible, eight hours after a labor managed under scopolamin-morphin. He emphasizes that he obtained similarly satisfactory results with early rising after laparotomy, a procedure which lately also has been recommended in this country by Ries, Boldt, etc. The question of leaving early the childbed during the past year furthermore has been discussed by Bouchecourt. "In some country districts it is a matter of emulation among the women to remain in bed as little time as possible before undertaking all the household work, and yet there seem few bad results. Among the richer classes, on the contrary, it is the habit to remain in bed a month, and it is difficult to get the patient to leave her bed." This writer reviews critically the various disadvantages and advantages of early rising and concludes that the advantages seem to prevail.

It is always difficult to break with old, time honored customs and views, but this suggestion of early rising (not exactly after eight hours) seems worthy of a careful consideration. There cannot be any doubt that the very long bedrest, which is not uncommon in the practice of some obstetricians among the wealthier class of patients, may prove harmful in various respects. The very general opinion that a puerpera *must* stay in bed at least a week is untenable as a strict rule.

During the last year interesting and valuable descriptions of very young ova have been published by Jung, Rauscher, Freund, Cova, Stolper and Leopold, the latter's monograph has just appeared in an English translation. Cova's paper contains the most complete review of the entire literature. All these authors confirm the implantation theory of Peters which at present seems to have been generally adopted by the writers of modern textbooks of obstetrics. Very interesting is Stolper's description of peculiar bloodspaces interpolated between the vessels of the decidua and the capillaries immediately surrounding the ovular chamber. By means of these blood reservoirs the minute ovum is protected against the direct and full force of the blood pressure in the maternal vessels. In a later stage of development these blood spaces permit an easier enlargement of that cavity which harbors the ovum. Freund's specimen is one of extreme rarity. It is an ovum approximately three weeks old, which shows a hydatiform degeneration of the entire chorion, including the choirion leve, a point of special interest.

In this connection mention may be made of a few articles dealing with the peculiar question, whether a well developed ovum can be completely resorbed in the uterine cavity, and a pregnancy thus simply disappear. In a case, reported by Polano, a bilateral oophorectomy was made during the fourth month of pregnancy. The uterus, both on palpation and during the operation on inspection, showed all the characteristics of an organ pregnant four months. After the operation the uterus gradually

grew smaller until it finally returned to a normal size and consistency, without any uterine hemorrhage or other symptoms having indicated that the ovum has left the uterus. Fraenkel calls attention to the fact that this spontaneous disappearance of an impregnated and well developed ovum from the uterine cavity frequently has been observed in animals after bilateral oophorectomy. He records another case similar to that of Polano.

There is one more obstetric problem of considerable interest which must be mentioned in this review. In the literature several cases of cadaveric rigidity of the fetus have been recorded. Ballantyne has collected isolated reports of 29 cases and has cited Tissot as showing experimentally that intrauterine *rigor mortis* actually occurs. Trimmer records a borderland case, in which the child having died as the result of a prolapsed cord stiffened half an hour after birth. Van Oordt, of Rotterdam, and Caruso mention 49 cases and to this number Jones (Jour. o. Ob. of Brit. Emp. vol. X.) adds four more of his personal observation. In his opinion there cannot be any doubt that every fullterm child, which dies in the uterus, stiffens. But unless the period of its rigidity happens to coincide with or overlaps the period of delivery, the rigidity cannot be observed. A still-born child may have died, stiffened and relaxed before delivery, or it may be born before it had time to stiffen, or it may be delivered in a state of rigor. In a case of Van Oordt considerable difficulty was encountered during a forceps extraction, this being due to the stiffness of the child. An interesting case is described by Mueller. A pregnant woman fell and hit her abdomen. Three days later, somewhat prematurely, labor began. The second born of the twins was in a state of complete rigidity. Jones very rightly expresses his surprise that this subject is passed over in silence by so many writers on obstetrics and on forensic medicine.

Turning next to the gynecologic literature of the past year one cannot help being impressed by the comparative scarcity of really new thoughts in the immense amount of gynecologic papers, which both in number and size so greatly outrank the articles on purely obstetric subjects.

In a short synopsis, as attempted in these pages, first place must be given to a paper of Van de Velde, an extensive abstract of which has appeared in the December (1907) number of this JOURNAL. This writer has demonstrated the extreme importance of blastomycetes (saccharomycetes) in the etiology of such gynecologic diseases as vulvitis, vaginitis, endometritis, pyosalpinx, cystitis, etc. He has found blastomycetes as the cause of peritonitis and puerperal sepsis, and has succeeded in positively revealing the source of this infection.

A paper of great scientific and also practical importance is that of Hitschmann and Adler (Zeitsch. f. Geb. vol. 60) which tends to overthrow the prevalent views concerning the histology of endometritis. These writers attempt to prove that the accepted ideas as to the normal histologic condition of the endometrium are erroneous and thus have led to a false conception of the changes resulting from inflammatory processes. In their opinion "endometritis glandularis hypertrophica and hyperplastica" have nothing to do with inflammation. The so-called hypertrophic

endometritis simply represents the typical premenstrual condition of the endometrium, while the hyperplastic variety comprises, on the one hand, normal premenstrual conditions, on the other, variations in the glandular tissue which still are entirely within physiologic limits. The only one true form of inflammation which they accept is the "endometritis interstitialis" in which the stroma shows those signs which in pathology are generally accepted as those of an inflammatory process. To very similar conclusions comes Theilhaber. He also asserts that we have no right to diagnose an inflammatory condition simply from the number, form and ramification of the endometrial glands. Schwab in examining the endometrium of 40 uteri was able to ascertain that alterations in the endometrial structure, corresponding with those of the several forms of so-called endometritis, could be found in clinically healthy as well as in diseased condition of the uterine mucosa. He, therefore, was forced to conclude that the diagnosis endometritis must be based on clinical symptoms and not on histologic findings. Very recently the views of Hitschmann and Adler have been fully confirmed by Hartje.

How thoroughly these interesting investigations are likely to change present views can be estimated from the fact, that at the last meeting of the A. M. A. in the obstetric section a committee, appointed to decide on a proper nomenclature of endometritis, reported, that a classification of endometritis should be purely anatomical, that a classification based on clinical symptoms, as catarrhal, purulent or hemorrhagic, is bad. "We may speak of acute and chronic endometritis. The chronic form may further be divided into glandular and interstitial, when the glands on the one hand, or the stroma, on the other, are especially involved. Pathologists may subdivide the chronic forms in order to indicate anatomical peculiarities, but this is not necessary for the clinician."

Several contributions of Riebold deal with the etiologic significance of menstruation in the causation or temporary aggravation of certain, especially infectious diseases. Older claims of Sabourin and Kraus, that fever during menstruation is indicative of a tuberculous process, had been confirmed by Franck. This writer stated that whenever inflammatory processes in the genital organs or accidental complicating diseases can be excluded, anemic patients must be considered strongly suspicious of tuberculosis if they show a regular rise of temperature during menstruation. Riebold found that this elevation of temperature is an almost typical occurrence in tuberculous patients, is, however, frequently observed also in the presence of other diseases, in which the increased metabolism of the premenstrual stage leads to an acute temporary aggravation of the pathologic process. He claims that this premenstrual fever is never seen in perfectly healthy women. This same author describes a periodic pyrexia with rheumatic symptoms in young girls, as the so-called "recurrent rheumatic ovulation fever." These patients during menstruation have more or less pronounced painful swellings of the joints, have symptoms of myocarditis, occasionally of peri- or endocarditis, frequently of pleurisy, and finally, in some cases, develop a parotitis. Riebold refers the pathogenesis to the process of ovulation. A few observations of this peculiar condition have also been recorded in

this country by Jones Dudley Morgan. Jaffé gives the reports of four post-mortem findings in cases of a general peritonitis occurring at the time of menstruation. He thinks that at this time the bactericidal power of the vaginal secretions fail and thus allows the infection to spread from below. Interesting in this connection is the observation of Scherer of a hemoptoe which up to the death of the patient during ten months regularly preceded menstruation.

The carcinoma question has remained practically unchanged. The first place among the operations, at present in vogue, is still held by that devised by Wertheim, the second probably by that of Mackenrodt. The present status of the permanent curative effect of these two operations is clearly reflected in the reports given by the originators of these operations at this year's meeting of the German Gynecologic Society.

Wertheim now has 120 cases operated upon more than five years. Recurrence took place in 53 of the 87 patients who had been kept under observation, but 61 per cent of all cases operated upon had remained free from recurrence for 5 years. The absolute proportion of cures, on Winter's basis (to total number of carcinoma patients seen) was 25.6 per cent. There were 60 more cases free from recurrence for 4 years. The improvement in the results of the extended abdominal method is due to increased skill in operating and to avoiding accidental injuries. The primary mortality in the last 140 cases has fallen to 8.7 per cent.

Mackenrodt can look back on operations for six years and a half, with an operability of 92 per cent, and a primary mortality varying between 19 and 21 per cent. Operation in 144 cases has been survived from 18 months to six years, cures might be claimed in 51 per cent of all cases.

These percentages of permanent cures sound encouraging but still are far from satisfactory. To a large extent the improvement of the results certainly is due to the fact that now these patients much earlier than formerly are operated upon. The propaganda for a better knowledge and appreciation of the first symptoms of uterine cancer is rapidly spreading. An interesting article by Milligan (Jour. o. Ob. Brit. Emp.) conveys a clear idea of the immense scope of this systematic crusade against carcinoma of the uterus in the different countries of the civilized world.

We may conclude this brief review with a short reference to those two new therapeutic methods which at present stand in the forefront of medical literature—the vaccine treatment after Wright and Bier's hyperemia.

Reports on the opsonin treatment in gynecologic practice, especially in cases of tuberculosis, are still scanty and hardly permit any deductions as to what has been achieved. Bier's hyperemia treatment has been introduced into gynecologic practice in various forms Appliances have been constructed to administer the suction treatment to the uterus in cases of endometritis and metritis, and the inventors of these apparatus invariably have reported very good results, which, however, in most instances still remain unconfirmed by other investigators. Really satisfactory results have so far been obtained with suction only in cases of mastitis.

## DERMATOLOGY AND SYPHILIS.

By J. J. Houwink, M. D.

The annual review of 1906 was devoted entirely to the subject of syphilis. Through the discovery of the spirochæta pallida by Schaudinn and Hoffman, in 1905, syphilis came so to the front in research work all over the world that an epitome of the investigations carried out was of the greatest importance and therefore the writer was justified in devoting his entire space to that subject.

Since then no subject in medicine has been taken up by investigators so universally as lues, and no journal on dermatology and syphilology or general medicine, has appeared that does not bring reports of new work done in this line. I think it proper therefore to continue the article by Dr. Engman with a review of the work done in syphilis research during 1907. As there is such an abundance of material, the most important work only will be mentioned in this paper.

*Etiology of Syphilis.* Following the work of Metschnikoff on inoculations of the syphilis virus in monkeys, came a contribution by Finger in the "Wiener Medicinische Presse" on "Neuere ätiologische und experimentelle Syphilis-Forschung." He stated in this paper that, according to his experiments with the inoculation of monkeys, he had found the African monkeys much more susceptible than the Asiatic ones. He urges therefore that an expedition be sent to Africa instead of to the Netherlands East Indies. He found that infection in the lower monkeys took effect only after deep scarifications and when a large amount of the virus was inoculated. And even then only a primary lesion appeared, without secondary exanthemata and constitutional disturbances. In his experiments with the higher monkeys the primary lesion always developed after the most superficial inoculation, and in every case this primary lesion was followed, in from 3 to 10 weeks, by secondary lesions and constitutional symptoms as known in the human. Through Finger's experiments it was first shown that tertian lesions and sperma of syphilitics are contagious, which gives us an entirely different view of the subject from that held before. It was Finger himself who inoculated, years ago, before the spirochæta pallida was discovered, a score of students with material from tertiary lesions and as none of them ever showed any symptoms of syphilis, his conclusion was that tertiary syphilis was not contagious.

At the Congress der "Deutschen Dermatologischen Gesellschaft," Neisser also stated that his experiments demonstrated that tertiary lues was contagious; he obtained the same positive results with the inoculation of sperma from syphilitics. He found that inoculation of meningeal fluid and of blood in some cases gave a positive reaction, and that syphilis in the latent stage is contagious is shown by his inoculations from lymphatic glands in this stage.

With Bruck, Neisser made experiments with extracts of human and animal organs, and of the brain of a paralytic. In 77 per cent of their cases they got a positive reaction, showing that progress in the line of serodiagnosis in syphilis may be looked upon as favorable. When using extracts of organs of healthy individuals, they always obtained negative results. Furthermore they found that if they had to do with a doubtful ulcer, and got a positive reaction, this was always followed by the appearance of secondary symptoms. While inoculating monkeys from monkeys, Metschnikoff found that the virus grows weaker when passed through the lower specimens; but it again becomes more virulent when inoculated from the lower monkeys into the chimpansee.

Hoffman showed in his pathological work that the spirochætæ when entering the body, first work themselves into the lymphspaces of the papillæ. From that point they go deeper into the connective tissue spaces and around the capillaries, where they multiply. He found them also very early in the nerves. In condylomata lata and in mucous patches the spirochætæ move towards the surface, making these lesions exceedingly infectious, as is well known clinically. As practical results from our knowledge of the cause of lues, Hoffman urges that every doubtful case be diagnosed as syphilis when the spirochæta can be found in the primary lesion. In lues latens, examination of enlarged glands may confirm the diagnosis, while in nephritis luetica the spirochætæ may be found on the urine sediment.

According to Neisser's investigations the spirochætæ are not found in ulcerating gummata. As soon as ulceration and degeneration had set in his results from inoculation were always negative, while they were most often positive before this stage.

In hereditary syphilis, Neisser always secured positive results from inoculations with heartblood, material from kidneys, liver and ovaries—organs from which, in acquired syphilis, no results by inoculation could be obtained. This shows that in congenital lues we have a more general distribution of the virus in all the organs and tissues, probably through the circulation. Even with mucous secretion from the nose of a baby suffering from hereditary syphilis a positive result was obtained.

Schucht found that syphilitic virus inoculated in a rabbit's eye, by making scarifications in the cornea and rubbing the virus in, or by injection of the virus into the anterior chamber, a typical condylomatous iritis was produced with an incubation stage of 11 to 23 days, and a parenchymatous keratitis with an incubation stage of 19 to 43 days. In sections of these eyes, spirochætæ were found in abundance, while inoculation from these lesions on monkeys proved to be positive only in a few cases. It seemed that the virus became less virulent in the rabbit's eye. Hoffman and Bruning made similar experiments and their conclusions confirmed the work of Schucht. They were also able to produce the same conditions in dogs.

To make the review complete we should mention that Siegel and his few followers are not yet convinced of the connection between the spirochæta pallida and syphilis. He still adheres to his opinion that

the spirochæta is only an artificial product of the staining methods used, and that the cytorrhyktes lues found by him, is the actual cause of syphilis. And as Koch's postulates are not yet susceptible of proof, it having been, thus far, impossible to obtain and grow the spirochæta in pure culture, we may expect that he and a few more will continue their struggle. This, however, cannot influence our belief that the spirochæta pallida is the actual cause of lues. We base our conviction on the constant presence of this parasite in luetic lesions; on its presence only in syphilis; on its definite relationship to the pathological changes found; on its morphological characteristics; and on its presence in the lesions of experimental lues in the lower animals.

The treatment of syphilis has not undergone many changes so far. Still a new agent has been used successfully in some cases as a curative and a preventive remedy and deserves to be mentioned, namely, atoxyl. Metschnikoff was the first to use atoxyl as a preventive measure in syphilis and found, in his experiments on monkeys, that the injection of 30 mg. of this drug, per kilogram of bodyweight, prevented the appearance of the primary lesion after inoculation of the virus, when injected within 15 days after inoculation. He tried this again and again at the Institut Pasteur, and always with the same good result. Applying the atoxyl preventive treatment to the human, an average injection of 2 grams should be made, which dose, however, is too high to be used safely. Hallepeau therefore tried an injection of 750 milligrams of atoxyl, followed in two days by one of 600 and again two days later by one of 500 milligrams, without observing any symptoms of intoxication.

The preventive treatment of Metschnikoff by rubbing in a 25 to 30 per cent calomel ointment, 1 to 2 hours after the inoculation, as mentioned before, always prevented infection in monkeys. In man, however, this treatment is of no value, unless it is used as a routine after each coitus. Further experiments in man have to show the value of the atoxyl preventive treatment and if it proves to be of benefit the prophylaxis of syphilis will be an easy matter if patients come early enough for treatment, which, however, is in our opinion very seldom the case.

That atoxyl is also of benefit in the later stages of syphilis is shown by Lassar, who obtained good results in primary, secondary and tertian lues, when treated only with atoxyl. Further experience, however, is necessary before atoxyl can be recommended, next to mercury and potassium iodide, as a routine.

The old question of how to treat the primary lesion has entirely changed since the later works on lues. Jacobsohn, Neisser, Joseph, Finger and Holländer, all strongly advocate the excision of the primary lesion, or destruction of it by Holländer's hot air treatment. In a personal interview Joseph told the reviewer that he believed he had saved at least ten per cent of his patients from developing syphilis, by an early destruction of the chancre. Finger reports a case in which the spirochæta was found, the lesion excised and no secondary symptoms appeared in a year.

As a new treatment for ulcerative and subcutaneous gummata, Karlinski recommends the use of collargol in the following ways: The lesion is cleansed and in the gumma are deposited 2 to 3 tablets of collargol ad 0.050. The lesion is then covered with collargol plaster. The same treatment is repeated once a week and as a rule a cure is accomplished in three weeks, leaving a smooth scar. Cases treated with potassium iodide and mercury plaster at the same time took at least seven weeks to heal. As a new drug for internal treatment of syphilis ought to be mentioned mergal, which is very highly recommended by Ehrmann, who says that mergal, or hydrarg., cholicum oxydat., in his experience has given as good results as injections or inunctions ever did. It does not produce any affection of the mucous membranes of the intestinal tract, it is easily absorbed and pleasant to take.

*Pityriasis Rosea,* by American dermatologists classified as an inflammatory disease of the skin, of which the etiology is unknown, is considered by some as a toxic erythema, by others as a mycosis, identical with herpes tonsurans maculosus, by Unna as a variety of seborrhoic eczema, etc. In our opinion it is due to a vegetable parasite, as all the clinical symptoms indicate such origin. We were not surprised therefore when we noticed in Finger's "Lehrbuch der Hautkrankheiten," which appeared in 1907, that the author classifies this disease under the vegetable parasites and mentions that Oppenheim, of Vienna, has found small, irregular and oval-shaped spores in the scales of several cases. Oppenheim himself read a paper on this subject in the Deutsche Dermatologische Gesellschaft and showed several slides with these spores. So far, however, he has been unable to make a pure culture.

*Favus,* in its clinical aspects, always the same in the human and always described as due to the Achorion Schoenleinii, may have different parasites as its cause. Bodin describes in the "Annales de Dermatologie et Syphilographie," a parasite which he found in typical cases of favus, and which is entirely different from the Achorion Schoenleinii in its microscopical aspects and in cultures. Still the clinical lesions cannot be differentiated from the ordinary forms and even microscopically he found the same pathologic changes in the skin. He calls this parasite achorion gypseum, and states that it must be very rare as he found it only twice in 200 cases of favus. In animals this parasite has not been found.

More interest is shown lately in the study of tropical diseases of the skin and as a result of this interest we find in the last year's literature descriptions of several tropical dermatoses, etc., of great importance. We will mention only a few:

*Venereal Granuloma,* a disease met with on the tropical islands of the Melanese, is contracted per coitum. Its first symptom is a small nodule under the epidermis, which soon breaks down, leaving a red, easily bleeding granulating surface. This lesion spreads gradually and may finally involve the whole surface of the body. In extreme cases it is accompanied by general cachexia and leads finally to death. So far only one white man has been infected. Mercury does not affect the course of

the disease. The only cure has been accomplished by extirpation of the diseased area. Kuhn, who describes 7 cases, calls it a new venereal disease.

*Gangosa,* known for 150 years by the Spaniards in the Ladrone and Caroline Islands, is characterized by a destructive ulceration, usually beginning on the soft palate, pillars or uvula, extending to the hard palate and nasal cavity, larynx and face. The active ulceration is followed by chronic ulceration, cicatrization and mutilation. Constitutional symptoms are slight or absent. It is mostly found in full blood natives, less in mulattos. On the Island of Guam there are now 250 patients suffering from this dreadful disease. The cause is unknown. Probably we have to deal with a specific infection, communicated by flies.

In addition to these diseases the finding of spirochætæ in frambœsia ought to be mentioned. Frambœsia shows the characteristics of a constitutional disease like syphilis and the finding of a spirochæta could therefore be looked for.

*Treatment.* It would be impossible to mention all the new drugs that are brought before the profession in a year's time, many of them to be forgotten as soon as they are tried. Last year, however, has brought us several new therapeutic agencies of real value. The general opinion of dermatologists is that now we have a valuable aid in the treatment of certain skin diseases by the introduction of the vaccine treatment of Wright. It is especially valuable in the treatment of acne indurata, acne pustulosa, sycosis non parasitica and in furunculosis. From our own experience we would say that the so-called stock vaccines are as beneficial as the vaccines procured from the lesions of the patient, which makes this treatment of value for daily practice, as it would be practically impossible to make a vaccine for each patient.

The use of carbon dioxid snow, as first described by Pusey, is based on the same principle as the treatment with liquid air. The intense cold, −90° C., produced on the skin by application of the snow causes the destruction of the lesion so treated, and a violent inflammation when applied sufficiently long. After these disturbances have disappeared, the treated part heals over with a smooth, soft, new skin, or hardly noticeable scar without any contraction. The treatment is of value in warts, calluses, senile keratoses, pigmented and vascular nevi, lupus erythematosus and in small superficial epitheliomata. A drum filled with liquid carbon dioxide from which the snow can be procured easily by opening the valve, can be had for a small price in every town and makes this treatment therefore available for every physician.

While the liquid air and carbon dioxid snow treatments were discovered in America, Holländer, of Berlin, came with his hot air treatment for certain dermatoses. Compressed air is guided from a drum through a Paquelin and heated to + 300° C. It is used as a destructive agent in lupus vulgaris, chancroid, chancre, gummata, angioma and torpid ulcers of the leg. The results in Holländer's clinic were very good. As the treatment is very painful, the hot air should be applied under chloroform narcosis. Bier's hyperæmia has been tried in certain skin

diseases, and while it is not a cure-all, it is of benefit in the treatment of acute purulent infections of the skin, like acne, furuncles, abscesses, etc., and also in ulcera gummosa cruris. The enthusiasm for the x ray has gradually calmed down to its normal proportions. Some years ago the x ray was considered curative of every skin disease known and the most favorable reports could be found in every medical journal. Nowadays the x ray is used in only a few diseases exclusively and in several others more as an adjuvant to other methods. However, it would be a great loss to dermatologists if we had to treat our patients without the help of the x ray. The diseases in which its use is of the most value are lupus vulgaris, acne vulgaris and rosacea, superficial epithelioma, psoriasis, indurated patches of lichen planus, eczema, favus, trichophytosis, and in the removal of superfluous hairs.

While it would require too much space to speak here of the indications for the use of the x ray in the diseases mentioned, we cannot finish this article without the statement that the x ray is of no value whatever in the treatment of epithelioma of the lip and of mucous membranes. In these cases the knife is indicated, and using the x ray is losing valuable time.

## SURGERY.

By Malvern B. Clopton, M. D.

In this review the most important articles of the year on some subjects will be noted in abstract, but no attempt will be made to comment.

In abdominal surgery the review is largely a retrospect, a tabulation of the results of large experiences. Gastric ulcer surgery has come to a high grade of technical efficiency and the physiology of the newly arranged alimentary canal, the nutritional changes and the limitations of this surgical field have been studied.

Musser (Am. J. of Med. Science, Dec. 1907) considers the medical versus the surgical treatment of gastric ulcer. This is a most elaborate statistical study, both of published cases, and from records of men in large hospital or private practices. The article is written by a medical man and his conclusion is that gastric ulcer is a medical disease, but he has compiled an interesting series of tables from the 1871 cases of gastric ulcer. To establish a cure he thinks we should have a lapse of at least two years without symptoms, with an approach to normal chemical conditions, and a removal of abnormal physical or mechanical states. To these requirements some authorities would add the absence of occult blood from the stools for long periods. The advantage of medical treatment is obvious, the danger of it lies in the sense of false security in a dormant ulcer, and the fact that the healing may be attended with grave sequels of adhesion, contractions and stenosis. The advantages of surgical treatment are evident enough in perforation, in repeated and chronic hemorrhages (but rarely in acute hemorrhages). If the symptoms and physical signs of retention from obstruction, hour glass contraction, or adhesion, suspervene and persist the case is surgical. The dangers of surgical treatment are the same as with medical treatment unless excision of the ulcer is resorted to, and to these add operative mortality and the 2 to 10 per cent death rate from complications or defects of metabolism, and the disadvantage of the psychic insult of the operation to debilitated subjects. If simple ulcer is productive of perversion of the secretory function alone it remains a medical affection. Inasmuch as hyperchlorhydria is in part a neurosis, the secretory function can be balanced chiefly by medical, dietetic and hygienic measures. Even if pyloric spasm attends the hypersecretion and hyperacidity, it does not necessarily take the case beyond medical care. It is wrong to submit such cases to surgery, unless motor disturbance becomes permanent. The serious duty is the selection of the surgeon, who must have much experience and good technical ability. After the surgical procedure is carried out, medical treatment must be continued for at least four months, hygienic and dietetic treatment carried over a period of years. The improvement in the surgical technique is noted and it is admitted that the statistics of Robson and Mayo in their end results compare favorably with, but are not better than similar statistics of men treating similar groups medically.

*Gastric and Duodenal Ulcers.*—Mayo (Annals of Surg., June, 1907). Nearly all the failures of ulcer surgery are to be found in the so-called clinical or medical or non-indurating ulcers, because (a) the ulcer is not located and many times its existence is problematical; (b) the condition is often confused with pyloric spasm, atonic dilatation, gastroptosis and gastric neuroses, or other morbid non-surgical conditions; (c) the ulcer does not give rise to mechanical interference with the progress of food, which would introduce an operative indication.

The location of the indurated ulcer is usually stated as ten gastric to one duodenal, while the author in two hundred cases has found eighty seven gastric, ninety-eight duodenal and fifteen independent in either viscus. This discrepancy is explained by the fact that the pylorus is usually incorrectly located (the pyloric vein runs upward on the gastric side of the pylorus for three-fourths of its extent) and since gastric ulcers rarely involve the last three-quarters inch of the pyloric end of the stomach, and duodenal ulcers are most frequently found very close to the pylorus, the mistake is made of calling what seems to be a pyloric ulcer a gastric ulcer. In sixty-nine cases of resected cancers of the stomach, 54 per cent gave a clinical history or a pathologic picture of having developed on the base of an ulcer.

Chronic nonindurating mucous ulcer is discussed at length with its indefinite symptomatology, which might be equally characteristic of other nonsurgical conditions. Pyloric spasm is the most misleading symptom, and it does not indicate ulcer alone, as it may accompany gall stones, appendicitis or tuberculosis of the cecum. Operations based on the belief or actual existence of nonindurating mucous ulcers have as a class been unsatisfactory, not because of a high mortality, but because in a large majority there has been no relief, or a new element of discomfort has been introduced. Operation on a mucous or undemonstrated ulcer, is not indicated unless there exist complications, such as perforation, hemorrhage or obstruction.

*Operations for Non-Malignant Diseases of the Stomach.*—Moynihan (Surg. Gyn. and Obstet. June, 1907).—The first class of cases discussed is the perforating ulcers. Of these there were twenty-seven, ten duodenal and seventeen gastric, with eighteen recoveries. One must not wait for quickened pulse rate and rigid abdomen before operation. The first symptom is sudden agonizing pain which almost reaches the limit of human endurance, and as a rule there is neither shock nor collapse. Exquisite tenderness of the skin is nearly always found. A diagnosis can be made from the history of ulcer, sudden intolerable pain, restriction of thoracic movements, surface tenderness, abdominal rigidity or restriction of the normally free abdominal movements. Early operation is indicated in all cases; the ulcer should be closed and infolded; excision is not necessary. Gastro-enterostomy is advised when the ulcer is near the pylorus and might cause obstruction, or where a second ulcer is present. Drainage is necessary only in the late cases and if used should be suprapubic and in the Fowler position.

The second group is the hemorrhagic cases, which are divided into acute ulcer and chronic ulcer cases. He has operated on thirty-three cases with the loss of six. Acute ulcers, when they bleed, are characterized by an abruptness of onset, rapid loss of a large amount of blood, and marked tendency to spontaneous cessation, and an infrequency of any but a trivial repetition. They never require operation. Chronic ulcer hemorrhages may be divided into four classes: 1. Hemorrhage, latent or concealed, trivial and inconspicuous. 2. Intermittent, moderate quantity, occurring spontaneously or capriciously, no jeopardy of patient's life from loss of blood, but presistent anemia. 3. Hemorrhage usually following a warning exacerbation of chronic symptoms, is rapidly repeated and abundant. Its persistence and excess are perilous and if unchecked will cause death. 4. Hemorrhage instant, overwhelming, lethal. The third group is the only class demanding operation. Gastroenterostomy alone is a satisfactory operation, but more recently the ulcer has been infolded by two rows of tight sutures about the base which include all the vessels inside.

The third group treats of chronic gastric and duodenal ulcers, and Moynihan's opinion is very emphatically in favor of posterior gastroenterostomy for all cases of simple ulcer, whether single or multiple, involving the pyloric region of the stomach or duodenum, although if active he thinks that the ulcer should be infolded or excised, and if extensive multiple ulcers involve a large part of the pyloric region, he believes in Rodman's excision of the ulcer bearing area. In the diagnosis he believes we can be fairly accurate in locating the ulcer, particularly so if it is duodenal; he believes a diagnosis of the ulcer can be made and its location determined from the history without examining the patient. Repeated stasis of the food for longer than twelve hours means organic disease. He places a high value but no certain reliance on gastric analysis. He does the posterior no-loop operation and he believes the only point to be settled in the technique is the direction of the gastric incision. He recommended formerly that this opening should be from above downward and to the right; later Mayo recommended from above downward to the left, but his experience with this direction has been very unfortunate. He now believes that the direction should be in the direction the duodenum takes as first observed when the colon is raised This may vary through wide limits. There were two hundred and six cases of gastric or duodenal ulcer operated upon, with two deaths; gastric ulcer alone in one hundred and thirty-eight cases, duodenal ulcer alone in forty cases, and both combined in twenty-eight cases. Gastric ulcer occurred twice as often in women as in men and duodenal ulcer three times as frequent in men. In all these cases after operation there were four cases which were no better. Two of these are "neurotic." In this series he observed fourteen cases of gastric tetany of varying degrees, all with a high degree of pyloric stenosis, dilatation of the stomach with hypertrophy of the wall and obvious peristalsis and a prolonged stasis of food. Gastroenterostomy relieved them; two of them had slight attacks and one a severe attack immediately after operation. The fourth group

is of hour-glass stomach. It is not infrequently associated with cicatricial pyloric stenosis. The cardiac pouch is usually larger than the pyloric and gastroenterostomy of the cardiac pouch will relieve the condition. There were twenty-four cases operated upon, with four deaths. Gastroplasty was performed seven times, gastrojejunostomy and gastrogastrostomy three times.

*Benign Lesions of the Stomach.*—Monroe (Annals of Surg., June, 1907).—There were one hundred and fifty cases followed from the operation to the present time, eighty-seven showing gross ulcer, sixteen medical or nonindurating ulcers, twenty-five cases of adhesions to the viscus and fifteen so-called neuroses, while nine were variously classified as ptosis, pyloric spasms, etc. Congenital pyloric obstruction and perforating chronic ulcer must evidently demand surgical intervention. There may be a question in other conditions. The reason for partial success in gross ulcer may be ascribed to the fact that undue prominence may be given by the patient, who for years has been watching her digestive apparatus, to eructation of gas or occasional vomiting, or there may be a weakened neurotic strain, or some intercurrent disease. Later sudden bleeding in two cases that had been cured for a year after gastroenterostomy, gave strong reasons for excising extensive ulcers, also to prevent malignant degeneration. In the sixteen medical ulcers, even if there was ptosis or an evidence of the stomach not draining itself, the relief was never more than incomplete and in this class of cases the abdomen is now closed without operating on the stomach. A diagnosis between medical nonindurating and gross indurating ulcers cannot be made without opening the abdomen. Adhesions to the stomach from the gall bladder or other regions, when broken up, give relief in the majority of cases. The worst class of cases to deal with is the neurotic, and these for the most part were made worse by operation, the practice is not to interfere with these cases. The operations used were the long and then the short loop of Moynihan, which was abandoned for the gastroenterostomy and enteroenterostomy, both with fair success. Roux's operation in Y was next with almost complete success, but the technique was too complicated. It was tried on some of the worst neurotics to prevent regurgitation of bile; nevertheless almost constant regurgitation followed. Now the no-loop posterior gastroenterostomy with the transverse slit in the stomach is the one employed. Finney's operation was used, and although slow to come the end results were good. After reopening a number of abdomens with varying intervals after anastomosis they failed to find any indication of closure of the opening when made with suture, but in two cases where Murphy's button had been used the gastroenterostomy had closed so that it had to be remade with clamp and suture.

*Pylorectomy for Benign Stenosis.*—Biechot (Revue de Chir., Jan., Feb., March, 1907).—In an extensive article pylorectomy is recommended as the correct surgical procedure for benign stenosis of the pylorus such as usually is caused by an ulcer. Gastroenterostomy is considered illogical on physiologic grounds, because the duodenum is shown to be essential

to the proper performance of digestion. It controls the movements of the stomach and its emptying through the pylorus; the passage of the chyme through the duodenum is necessary to the proper functioning of the biliary and pancreatic apparatus. In ulcer there is always danger of cancer developing later, or a perforation or a hemorrhage, which are not prevented by gastroenterostomy. The complications following gastroenterostomy such as vicious circle or volvulus of the intestine or the development of peptic ulcer, are great drawbacks to the operation. On the other hand pylorectomy overcomes all these objections, removes the offending ulcer, leaves a physiologic canal and gives an immediate and ultimate cure. He quotes statistics to show that the mortality of gastroenterostomy is about 5 per cent, and that in pylorectomy the percentage is about the same. But even though the immediate mortality from pylorectomy is greater, the fact that the cure is complete makes the balance fall in its favor, as opposed to a less mortality from gastroenterostomy with its subsequent greater risk. Quite a number of cases are appended which show the results of such operations.

*The Operation of Gastro-Jejunostomy and its Effects.*—(Lancet, Sept. 21, 1907).—Paterson summarizes a very interesting paper as follows: (1) A certain amount of bile and pancreatic juice enters the stomach after gastro-jejunostomy, but the amount is small and has no injurious effect. (2) The acidity of the gastric contents is markedly diminished, usually about 30 or 35 per cent. This is due, partly to a diminution of the total chlorids secreted, partly to the partial or complete neutralization of the free hydrochloric acid by the alkaline bile and pancreatic juice, and probably also to earlier stimulation of the pancreatic secretion, and compensatory earlier fall of the gastric secretion. In gastric ulcer cases the removal of spasmodic stenosis of the pylorus likewise tends to diminish the total acidity. (3) Gastric digestion is impaired but not lost after gastroenterostomy. (4) The motility of the stomach, if normal before operation, is for practical purposes, unaffected. Gastro-jejunostomy is therefore not a drainage operation. Its beneficial effects on gastric ulcer are due to the diminution of the acidity of the gastric contents. (5) Gastro-jejunostomy has no material effect on the metabolism of the human body, the percentage of nitrogen and fat absorbed being within the limits observed in individuals who are apparently healthy. This chemico-pathologic evidence is supported by the evidence of clinical experience.

*Operation for Perforation of Ulcer of the Stomach.*—Körte (Arch. f. Klin. Chir., Bd. 81, Th. 1).—In this article the author gives a second series of perforating ulcer cases numbering 19, with 13 recoveries. (In the first series published in 1900, of the 10 operated cases only one recovered, but all the cases came to operation with at least a 24 hour interval after perforation). In this series of the 6 cases operated upon before 10 hours after perforation all recovered, of those operated between 10 and 19 hours, 5 of the 7 recovered, and of those operated after the 20th hour only one of the 6 recovered. The chief factor is the time after perforation that the operation is done. In the literature since 1902 there

are 95 cases of perforation of gastric ulcers reported with 51 recoveries. Of Körte's 19 cases, 12 gave a history of previous pain from the ulcer, but 4 had been entirely free from stomach symptoms. Four of the cases had been previously gastroenterostomised, one 5 years previous, another 3 years before had an anterior gastroenterostomy, a third had a similar operation only 9 months before, a fourth had a posterior gastroenterostomy which contracted after 3 years, and a second fistula was made in the anterior wall, and 9 months later the stomach perforated. Two of these perforations were at the junction of the stomach and gut; one was a new ulcer. The fact that in six years with 19 cases, four perforations occurred after operations which are thought to be curative, shows that we cannot hope that gastroenterostomy will cure all. The cause for perforation was hard to determine except in two instances, when the pain followed immediately after lifting heavy loads. Pain is the first symptom, and is constant. (Morphine should never be given as it masks the picture). The most valuable objective sign is tension of the abdominal wall. Tenderness is usually most marked in the epigastrium. The pulse in the first hour is not a good index; not, in fact, until peritonitis is developed. Liver dullness and free gas in the belly only come later in the disease, and should not be waited for, as the only hope of recovery lies in the earliest operation. Leucocytosis is not regarded as determining, as the observation can in these cases only be made once. The differential diagnosis between perforated appendix, gall bladder or pancreas can often only be determined by operation. Operation in all the cases was under general anasthesia, a long incision through the right rectus exposing the field. The ulcer was either excised or closed without incision. In one instance where the ulcer was so closed to the pylorus that stenosis seemed likely after closure, an immediate gastroenterostomy was made. The perforating ulcer was in half the cases at the pyloris or close by; in 5 cases in the middle of the lesser curvature; the others were near the cardia, two at the point of the earlier gastroenterostomies, one in the jejunum below the gastroenterostomy and one in the duodenum.

*Perforation of Gastric Ulcer.*—Martens (Deutch. Med. Wochen. Vol. XXXIII. No. 45).—Operated 10 cases with 6 recoveries. All cases were sent to the hospital with a diagnosis of appendicitis and peritonitis. He closes the perforation by double sutures and brings up the omentum which he fastens and then packs to the ulcer with gauze after flushing the cavity with saline, and drains with tube wrapped in gauze.

*Subacute Perforation of Stomach and Duodenum.*—Moynihan (Annals of Surgery, Feb., 1907) has operated upon 15 cases; some of these were cases of empty stomach at the time of perforation (acute perforation nearly always comes with a full viscus). One case had a perfect plugging with a tag of omentum. The opening may be covered with plastic lymph which closes it, or the ulcer may become adherent at its base to the anterior abdominal wall, the liver or the pancreas. In every particular save one, that is intensity, the symptoms are the same as in acute perforation. Operation should be done early, the ulcer infolded if the adhesions are

easily separated, but some old fibrous conditions are best met by gastroenterostomy.

Connor (Am. J. of Med. Science, March, 1907), considers *Acute Dilatation of the Stomach* and reports a case. He collects 102 cases from the literature and after a study of the histories concludes that the condition rests on no single pathologic basis; he believes that the most important single cause is the incarceration of the lower end of the duodenum between the root of the mesentery as it passes in front of it, and the vertebral column behind. It most frequently follows operation under general anesthesia, but quite frequently the dilation can be ascribed to errors in diet. Smaller numbers of cases occur in the course or during the convalescence from wasting disease, or develop after injuries, and an interesting group is that associated with deformity of the spine. Vomiting and distention are the most important symptoms, pain and constipation being frequently noted. Next to vomiting, collapse is the most prominent symptom. About three-fourths of the cases recover. The stomach tube should be used early and often, and food and drink by mouth stopped, rectal feeding being substituted. As he believes that one-half of the cases are due to duodenal constriction by the mesentery, he thinks the belly position should be maintained. In these cases the mesenteric artery running in it is stretched tightly across the duodenum by the weight of the small intestine hanging over the brim of the pelvis.

W. Braun and H. Seidel (Mitt. a. d. Grenz. der. Med. u. Chir., Bd. XXII. 5) considers the subject of *Acute Gastric Dilatation* both from an experimental and a clinical field, and conclude that acute motor insufficiency is the basis of the affection, which may be a separate disease, or an accompaniment of chronic debilitating trouble, and that it is truly functional and not of a mechanical nature. With the acceptance of the theory of disturbed innervation of the stomach and weakened musculature, all the surgical forms of acute dilation can be explained, particularly those after anesthetics, laparotomies, traumas, spinal lesions, etc. A direct weakening of the muscular action may be caused by mechanical, inflammatory or toxic lesions. Accompanying this change is a hypersecretion. Chronic dilation can have a mechanical role in the causation of acute dilation. They believe, however, that the arteriomesenteric root crossing the duodenum and compressing, has little to do with the dilation of the stomach, but is an inconsequential finding in those cases where the functional dilation is primary.

Herte (Mitt. a. d. Grenz. Med. u. Chir. Gedenkband f. Mikulicz) recounts a case which had for twenty months been suffering from ulcer and chronic dilation of the stomach, in which vomiting of large quantities was a most prominent feature. Just previous to the operation a mass could be felt near the pylorus. A laparotomy under ether showed a stomach dilated to two-thirds the size of the abdomen, and a carcinoma of the pylorus, which was removed, the anastomosis being made with the duodenum after the first Billroth method with a Murphy button. For three days the patient did not vomit, but on the fourth day and up to the ninth day the vomiting continued, as much as a liter of brown, bitter

fluid coming up at a time. On the ninth day vomiting stopped and abdomen began to distend from a dilation of the stomach, which soon reached between the symphysis and navel. Under cocaine a posterior gastrojejunostomy with a short loop was done. Vomiting lasted for two days after this operation, then ceased and recovery followed. In this case the hypersecretion was so marked that the stomach muscle could not push it through a patent opening left by the operation, and in three days' time, despite the fact that two-thirds of the stomach had been resected, the organ was dilated to a size as large as it was before operation.

Bloodgood (Annals of Surgery, Nov., 1907) reports on *Acute Dilatation of the Stomach* in six cases. To his mind the "chief etiologic factor seems to be some toxic agent in a patient weakened by previous disease and suffering from some chronic gastric lesion. In some cases the toxic factor may be sufficiently great to produce paralysis with hypersecretion in a stomach previously dilated." He believes that there is a group of cases in which no evidence of a pathological condition is found to explain the obstruction other than the normal anatomical factors at the mesenteric junction of the duodenum and jejunum. He suggests for those cases of chronic gastroduodenal dilation, of which he reports a case (this is probably the common pathologic condition of many gastric neuroses which have not been relieved by posterior gastroenterostomy), that many may be relieved by a duodenojejunostomy, which will meet the condition and drain the distended duodenum. In two cases after relief of the mesenteric tension and pressure on the duodenum the obstruction was not overcome, so he emphasizes the importance of hypersecretion. Two of the cases followed pyloroplasty (Finney) which suggests that in chronic dilation of the stomach with hypersecretion it is better not to select a Finney operation, or a Billroth gastroduodenal end-to-end after pylorectomy, but to do a gastrojejunostomy with a short loop.

The faithful use of the stomach tube with change of position of patient to knee chest, or left lateral with elevation of the pelvis, should give relief in the majority of cases, but when dilation persists and the fluids fail to pass and the patient becomes weaker from loss of fluid, operation should be performed.

*The Mesocolic Route: Cholecystojejunostomy, Transmesocolic Gastroenterostomy.* Lotheissen (Zentralbl. f. Chir., 1907), says that the posterior retrocolic gastroenterostomy is considered by most surgeons as the normal method. The only objection to it is the occasional occurrence of a vicious circle. Lotheissen has yet to see a failure with it either in v. Hacker's clinic or in his own. Brentano has recently shown that the anastomosis between the gall bladder and the jejunum should be done through the mesocolon. Lotheissen recommended this operation in 1903. The suture is easily carried out after the opening in the gall bladder has been made. The intestine is tied off with a strip of gauze, as in a gastroenterostomy, and the gall bladder, after the abdomen is packed off with gauze, is carefully punctured and completely emptied. This permits one to palpate the head of the pancreas and to exclude stones in the common duct. When the operation is completed the gall

bladder lies in the opening of the mesocolon and the visceral situation is normal. The peristaltic movement is unchanged. In doing a gastro-enterostomy, Lotheissen also works through an opening in the mesocolon, in this way doing a posterior gastro-enterostomy. Only once was it necessary to anastomose the jejunum to the anterior wall of the stomach. It is often impossible to bring the transverse colon upward to expose freely the posterior stomach wall. After the operation is completed through the mesocolon, this is closed with a few sutures.

*The Technic of Closing the Blind Duodenal Stump After Resection of the Pylorus.*—(Billroth II.) Krogins (Zentralblatt fur Chirugie, No. 39, 1907).—Various methods have been devised to dispose of the blind end of the duodenum, after resection of the pylorus, or of the pylorus and the first part of the duodenum, for carcinoma (Billroth's method II.). Brunner tries to extraperitonealize the stump, Steinthal covers it with omentun and gauze drains. The chief difficulty is due to the fact that the posterior surface of the second part of the duodenum is not covered with peritoneum, and that this surface is soft, friable and not tolerant of suture. Krogins overcomes the difficulty by mobilizing the bowel, even, when necessary, separating it from the pancreas. The duodenum is then cut across and either tied off or closed by suture. The oblong posterior area that is not clothed with peritoneum is now covered by a row of transverse Lembert sutures, and as the blind duodenal end is reached the stump is invaginated and the suture continued. Although the lumen of the bowel is thus slightly narrowed a good peritoneal covering is obtained and the safety of the stump assured.

*The Operative Indication in Gastric Carcinoma.*—In an elaborate article based on hundreds of cases, most of them original, Nyrop (Archiv. fur klin. Chir. LXXXII. H. 4) proves again the now generally accepted dictum that symptoms of cancer of the stomach are simply those of pyloric obstruction, and that obstruction from any cause may be characterized by identical symptoms, with hydrochloric acid deficient and lactic acid present. Moreover, nonobstructive cancers are often symptomless. Nyrop holds that operation is imperative when the remains of food are habitually found in the stomach twelve hours after eating, or when there is a palpable tumor. In all cases of chronic and persistent delayed indigestion not cured by internal treatment the operation should at least be considered. The diagnosis between ulcer and cancer is complicated by the frequency with which a cancer develops on an ulcerative base. The age incidence of cancer and ulcer corresponds closely (thirty to fifty-five years). Emaciation is an expression of lost motility or obstruction, and is dependent upon the position and extent of the lesion and not its nature. Even the long standard test of hydrochloric acid is not more to be depended upon, since this acid is absent in a number of gastrointestinal affections and is habitually absent in 40 per cent of persons over fifty. Lactic acid is simply a sign of retention fermentation. Hematemesis may occur in cancer, ulcer or hepatic disease, or even with no demonstrable lesion. Coffee-ground vomit and palpable tumor have a certain diagnostic value, but they occur too late to be of practical service.

The only possible early diagnosis is that of obstruction. The nature of the obstruction must be determined by an operation. Nyrop distinguishes between functional and organic obstruction, holding that symptomatically the two infections can be differentiated by a certain intermittence of symptoms in the former cases. Nor are apparently functional or spasmodic cases so benign as to be relegated to conservative treatment. They may complicate ulcer or cancer, or may in themselves induce a sphincteric hypertrophy leading to organic obstruction, dilation, and atony of the stomach; or by interference with the blood supply, from pressure on the vessels, causing ulceration. Tetany may develop as a complication of a functional pyloric narrowing. In view of these dangers Nyrop does not hesitate to advise exploratory operation in every case of pyloric obstruction, whether it be due to pylorospasm or to valvular obstruction with or without associated gastroptosis, since the symptoms are completely relieved by gastroenterostomy. The relatively favorable results of operation on pyloric cancer as compared with those of intervention for the relief of malignant infiltration of other parts of the stomach are attributed entirely by Nyrop to the fact that in the former case obstructive symptoms lead earlier to operation. Nor could he cite a more striking instance of the symptomless course of non-obstructing gastric carcinoma than that of Mikulicz, who accidentally discovered his own cancer while palpating his abdomen, but not until it had attained a growth that made it inoperable. Nyrop concludes the paper by urging a test for gastric retention in all stomach disturbances. The test he prefers is that of Bourget. The patient is given a meal of bread, meat, and eight to ten cooked plums at 8 p. m., and at 8 the next morning the stomach is carefully washed out. Unless there be gastric retention no food remains will be found in the washing.

For the determination of the effect of posture on retention the plum and meat breakfast is given at eight in the morning, the patient walking about after his meal as usual. At eight in the evening the stomach is washed out, and if the remains of plums are found the diagnosis of obstruction is assured. Nyrop's conclusions are in general except by those who have made the most careful medical and surgical study of gastric carcinoma. It remains to be proven, however, that his dictum to the effect that every one who has chronic stomach trouble should be given plums, and that if these plums or parts of them can be recovered by the tube in twelve hours, operation should be performed, is subject to so few exceptions as to make it a safe and wise working rule.

*Future Results in Cancer of the Stomach.*—Hoffmann (Mitt. a. d. Grenzgeb. Med. u. Chir. Gedenkband f. Mikulicz).—Are we to expect better results in the future from the surgical treatment of the stomach cancer, and is there a definite relation between the clinical duration of the disease and its operability? To decide these points the 655 cases in Mikulicz clinic were studied. Many more men than women were observed (416 to 239), but the resected cases were about equally divided (87 men to 77 women). This is explained by the fact that enteroptosis and relaxed abdominal walls are most often observed in women, making

tumor evident to examination when still small, and these are the most favorable cases for operation. Out of 163 cases of resection of the pylorus 21 were free from recurrence after two years. In many cases it was possible definitely to establish the beginning of the trouble, in others not so easy until the operative findings were consulted. But in considering the facts it was shown that only 18 per cent of these cases consulted the clinic in the first three months of their illness, about 50 per cent in the first six months and only 83 per cent came to surgical treatment in the first year of their illness (an average of 10.3 months for all cases), a very late stage of the disease for satisfactory surgical care. About 4 per cent of the cases showed a tumor at the time of the first symptom. The great inadequacy of methods of stomach examination, and the great danger of delay make it imperative that all doubtful cases be immediately sent by the general practitioner to a stomach specialist or to a surgeon. No doctor can say whether the tumor is or is not operable, and all doubtful cases should be given the advantage of an exploratory laparotomy. He shows that the average time from the appearance of the disease to the time of operation for cases whose pylorus was resected is 9.5 months, while the time for non-radical operations was 11.2, a difference of 2 months in which the cases have passed over the stage of operability. The author concludes that we have little to expect from improved technique or improvements in the methods of stomach examination. The cases will seek a surgeon earlier only by a more thorough instruction of the general practitioner, and the laity that salvation lies in seeking surgical aid early. There is a definite relationship between duration of the disease and its operability.

*Peritonitis.* Reviewing the growth of the modern treatment of peritonitis, quoting the published result of various operators, we find the majority of them differ from one another only in some slight modification of technique.

Robson (Lancet, Dec. 29, 1907) considers the salient points of treatment to be: 1, removal of the cause with or without irrigation of the peritoneal cavity; 2, drainage of the site of operation and of the pelvis, aided by the semi-sitting posture; 3, rapidity of operation; 4, avoidance of unnecessary exposure and handling of the viscera; 5, the prevention of shock; 6, the administration of saline fluid by the rectum; 7, rectal alimentation and stoppage of mouth feeding; 8, the avoidance of opium, and sometimes the administration of repeated small doses of calomel after operation.

It is interesting to note that a similar degree of success has been attained by many surgeons, though one favors the promotion of intestinal rest by the administration of opium, another advocates free action of the bowels by saline or other purgatives, one believes in local irrigation without subsequent drainage, while another is content with mere local sponging and tube drainage.

These are the results chiefly of the treatment of peritonitis due to perforation or necrosis of the lower portion of the intestinal tract, as exemplified by acute appendicitis.

Buxton (Jour. Med. Research, 1907, XVI.) shows that bacteria are rapidly absorbed after injection into the peritoneal cavity, in five minutes being found in the blood, and in great numbers in the lymph nodes of the mediastinum where they go after rapid absorption from the diaphragm. The omentum is the only other part of the surface which takes part in this absorption. When colon and typhoid cultures are injected into the peritoneum if death follows it is within two hours after injection, or not until twenty-four hours, because these bacteria contain endotoxins, which are not liberated until the organisms are disintegrated, and if the numbers of bacteria taken up are great the liberated dose of the poison is so intense that it is overwhelming. But should the animal survive, it may die later when the organisms have multiplied sufficiently. Streptococci on the other hand are not so rapidly destroyed after injection hence a primary overwhelming with endotoxins does not occur, and death does not follow until there has been a great multiplication after twenty-four hours or more. In acute peritonitis the thing to guard against is the absorption of bacteria themselves, and as these enter through the lymphatics, particularly of the diaphragm, the effort should be made to keep the infection low down in the abdomen and pelvis. Irrigation favors the dissemination of bacteria and should be avoided, as should sponging and similar measures.

*General Peritonitis Following Appendicitis.*—Fowler (N. Y. State J. of Med., Oct. 1907).—The report is based on 145 consecutive cases of diffuse peritonitis. Operation was not refused those almost moribund cases, for occasionally miraculous recoveries ensue. Six cases died in the course of operation. Cure in those cases surviving the operation was 62 per cent. Twenty-eight cases died in the first twenty-four hours, 16 died in the second twenty-four hours. The incision was small, the appendix removed, after packing off with wet sponges wrung out of 1-3000 bichloride. The immediate neighborhood is flushed with a warm solution of equal parts of peroxide of hydrogen and bicardonate of soda, followed by salt solution. In the first one hundred cases peroxide irrigation was used for pus collection in the pelvis and elsewhere in the cavity, but in the last forty-five cases peroxide had not been used above the umbilicus except for separate collection of pus. The whole abdominal cavity was completely flushed with salt solution, introduced through a Chamberlain douche nozzle. The average time of operation was twenty minutes. Whenever necrotic abscess cavities existed these were drained with gauze wicks brought through the wound, in addition to whatever form of pelvic drain was used. In 116 cases glass or rubber tube drains with gauze wicks were introduced into the pelvis and this pelvic drain was made long enough to allow a separate bundle of gauze dressing to be attached to it, and to allow the changing of these dressings independent of the dressing of the wound. Six cases were drained through the vagina. Three cases were closed without drainage and all recovered. Those cases which can be closed must have no necrotic areas, and there must be no blistering, desquamation, swelling or infiltration of the serosa. Directly after operation the patient is placed in the elevated head

and trunk position; those with much shock cannot be raised as high as the others for the first few hours. Saline enemata of a pint or quart are given every three or four hours. The average stay in bed of cases recovering was twenty-two days.

*The Treatment of Diffuse Suppurative Peritonitis.*—Blake (Am. Jour. of Med. Sciences, March, 1907).—The report is on 99 cases with a definite purulent exudate, extending throughout the greater part of the peritoneal cavity. Seventy-eight cases were due to appendicitis, 13 followed perforating ulcer, 8 were from perforation in typhoid. The principles of the treatment were to remove rapidly the origin of the inflammation, to irrigate the peritoneal cavity, and not to drain the general peritoneal cavity. The desirability of washing the peritoneal cavity is disputed, but the chief objection to the author's mind is the additional time required. The double current irrigator is used with normal salt solution until all the septic material is removed, and by its use it is claimed that septic material is not diffused. Washing in this way accomplishes more quickly and effectually what the drainage of the cavity is intended to do. This washing is done through a small opening, which is later partially closed and a small drain inserted down to the peritoneum, unless deep drainage is indicated, such as imperfect removal of the cause of the peritonitis, necrotic material, or ozzing. The patient is returned to bed in the Fowler position. Intermittent irrigation for forty minutes at a time, of the colon through a double rubber tube every three hours for two days, or a constant slow method by syphon is used. The stomach washed out, and no food given until peristalsis is established. Blake believes that the improvement in the results of treatment in this class of cases has been general and does not depend so much on whether lavage or general drainage has been employed as upon the increased rapidity of getting the patient off the table, the use of large quantities of fluid by bowel, rest for the gastrointestinal tract, and possibly the Fowler position. Of the 78 cases of peritonitis, caused by appendicitis, death occurred in 15 (19.2 per cent mortality). Of these half were drained. Of those recovering, 31 were not drained, 28 were drained to the appendix stump and 4 drained to the pelvis. Of the 13 stomach ulcer ruptures 4 died (30.7 per cent), 3 of these perforating over 36 hours before admission. Of the death and recoveries half of them were drained to the suture line. The other half not, only one case being drained to the pelvis. Of the 8 typhoid cases 4 died (50 per cent), 3 were drained and one drained to the pelvis. Of the 4 recoveries, 2 were and 2 were not drained into the pelvis. The abdominal wounds were drained in all cases. The author's personal impression was that patients made a smoother recovery when not drained.

Monk (Bost. M. & S. J., June 20) recommends opening the bowel in several places and *flushing the intestinal canal* with hot salt solution, in cases of *general peritonitis* where he believes the absorption is as great from the inside as from the peritoneum. The case in which he tried this method was one of stroptococcus peritonitis so grave that there seemed no hope for the child. The first opening was made high up in

the jejunum and a large quantity of salt solution directed down the canal, the next opening a few feet below, from which a great quantity of salt solution and intestinal contents and gas were discharged, then salt solution was introduced through the opening, the effect of the hot solution being immediately shown by improvement of the pulse and general condition. The peritoneal cavity was irrigated and a cigarette drain introduced into the pelvis. A rectal tube introduced soon after let a great quantity of feces and water pass. The child recovered.

H. Hoddick (Zentralblatt f. Chirugie, No. 41, 1907) gives his experience with intravenous injection of *adrenalin* in salt solution in cases of *general peritonitis*. The operative technique is to make a small opening, sponge out the pus without eviscerating, removing the cause of the trouble, and to pack with iodoform gauze which is left in place from five to eight days. At the operation the condition of the patient does not always require the adrenalin, but it is a rule to give immediately from 750 to 1000 c.c. of salt solution with from 6 to 8 drops of adrenalin into a vein taking 20 to 30 minutes to complete the flow. This is repeated later if necessary. The heart is stimulated in this way and elimination is rapid. The results before this injection was used were 14 deaths in 20 cases, since the method was introduced there has been only 3 deaths in 16 cases.

*Typhoid Perforation.* In reviewing the numerous articles on typhoid perforation we will mention only the points on which there is a discussion, as it is evident that in most of its phases this subject is familiar to the profession. Pain usually sudden and severe, occasional slow and not intense, is regarded as the symptom to indicate the condition in the great majority of cases. Tenderness and rigidity are regarded most valuable signs. The perforation is most frequently in the ileum within 18 inches of the ileocecal valve. The frequence of perforation is more common than generally supposed, variously stated from 1.2 per cent to 11 per cent, the statistics of Harte and Ashurst placing it at 2.54 per cent, and they state that one-third of the deaths in typhoid are due to perforation. Perforation is most common in the third week of the disease.

Harte (Boston M. & S. J., July 18, 1907) reviews the work in *typhoid perforation* at the Pennsylvania Hospital, Philadelphia. Operation has been performed on 80 cases, 15 recovered, giving a mortality of 81.25 per cent. In 600 cases he analyzed the mortality was 75 per cent, which he regards as too favorable because the reported cases are most likely to be the cured ones. He operates as soon as a diagnosis is made, uses general anesthesia (ether sometimes preceded by ethyl chloride) because ether is a heart stimulant, and because he can work faster than with cocaine. A right sided incision is used, the perforation is usually sutured but occasionally an artificial anus is established. If the operation is done early and the peritoneum is not much involved gauze will cleanse it, but if the infection is far advanced and the pelvis is filled with fluid, the abdomen is thoroughly irrigated with salt solution. Drainage is maintained by gauze rolls in the places where the fluid is wont to accumulate, in the pelvis, the loins and between the folds of intestine and

along the suture. In typhoid he does not believe in the Fowler position, because the patients are exhausted, and frequently toxic and delirious. No food is given until the fourth day. In cases of doubt he operates, and does it early.

Scudder (Boston M. & S. J., July 18, 1907) in discussing *mistaken diagnosis in cases of typhoid perforation,* groups mistakes as (1) those in which no lesion is found, (2) those in which the lesion does not involve the peritoneum, (3) those in which the lesion is found inside the abdomen involving the peritoneum. In the second group are cases of pneumonia, gastritis, enterocolitis, hemorrhage—Zenker's hemorrhagic degeneration of the abdominal muscle and distended bladder. To the third group he assigns cholecystitis and perforation of the gall bladder, which is most frequent, rotation and sarangulation of Meckel's diverticulum. Femoral and iliac thrombosis, and ovarian cyst infection. He reports a case in which the pyosalpinx was due to a pure typhoid, which ruptured, produced peritonitis, was operated and recovered.

Farrar Cobb (Boston M. & S. J., July 18, 1907) reports on 20 cases of *typhoid perforation,* operated at the Massachusetts General Hospital, and in addition there were 3 cases operated under a mistaken diagnosis. There were six recoveries, 70 per cent mortality. Those recovering were operated respectively 23, 24, 23, 12, 8 and 6 hours after perforation. Of those dying 8 cases were operated within an interval of less than 12 hours after perforation. Cocaine was used in one case followed by ether, in the rest ether alone was used. In all but one case the perforation was closed, but at autopsy on one case the question was raised whether the cause of death was not largely due to intestinal obstruction because of excessive inversion of the intestinal wall. He believes that certain typhoids are so sick that perforation and spreading peritoneal infection cannot be diagnosed until wide and fatal. Some cases may have sudden perforation and free extravasion, with fulminant symptoms, in which operation must be done at once. Mild (typhoids) are marked by less severe symptoms usually localized, the severe symptoms follow general peritonitis, and leucocytosis in this case may give valuable corroborative evidence, but operation should be done in suspected cases whether or not there is leucocytosis. Only one case had the abdomen closed without drainage and it died. Pelvic drains were generally used, tubes either glass or rubber in a few cases in addition. In four cases no irrigation was used, one recovered.

Allaben (J. A. M. A., August 17, 1907) gives a statistical study of *perforation in typhoid* and shows that the treatment is giving better results recently. Up to 1903 there were 362 cases operated with a mortality of 74 per cent. From 1903 to 1907 there have been 162 cases reported with an improved mortality of 62 per cent. While the prognosis is always grave, it is modified by several factors. (1) The physical condition previous to infection, (2) the character of the infection, (3) the character and virulence of the peritoneal infection, (4) the age of the patient, (5) the time elapsing between the perforation and the operation. He shows that in 81 cases operated within 8 hours after perforation

the mortality is 45 per cent. In outlining the treatment, rapidity counts much. He does not irrigate or sponge because he believes this causes spread of the infection and favors absorption of the toxins. He drains into the pelvis with (Fowler) tubes and uses Fowler's posture, and gives saline solution to illiminate the toxin.

Selby (J. Am. A., June 22, 1907) gives the mortality of typhoid perforation after operation as 75 per cent in 400 cases. He considers muscle spasm the most valuable physical sign.

*After Treatment.* In a symposium on the care of abdominal wounds and after treatment J. M. Baldy remarks that if his patient had gone from the operating table free from sepsis, hemorrhage and shock, that the after treatment is of little importance as far as recovery from the surgery is concerned; it is of principal importance as to the relative comfort of the patient. Simplicity is the key note. Rest and time are the panacea. His idea is to do nothing by routine. Feed at the end of 48 hours, give small doses of morphine if necessary. He sees no advantage in letting routine cases stay abed longer than two weeks, but in some worn out cases forcing them to get up in this time is irrational, in 24 hours, brutal. He does not believe prolonged rest in bed has any danger such as thrombosis, embolism, or phlebitis. He admits patients can be up and home in a week or ten days, but he denies that this is best for many of them, as they should be sent home well, not soon.

H. J. Boldt is an extremest and believes that in all but 10 per cent to 15 per cent of the cases, with a properly applied adhesion plaster scultetus the patients can and should be out of bed in 24 hours. Counter indicants are frequently vomiting, rapid or irregular pulse, and elevated temperature. By this early mobility he claims food is better assimilated, circulatory disturbances less likely (thrombosis and pulmonary sequelæ), intestinal peristalsis is quickened and peritoneal adhesions fewer. If there is no special reason for inducing an action of the bowels earlier than the fourth or sixth day the use of enemata or cathartic is omitted until then, when a spontaneous action usually takes place. If oozing or peritonitis is likely patients are kept in bed longer in the Fowler position.

A. Laphorn Smith strikes a moderate note in the after treatment of abdominal sections. Thirst is relieved by enemata, vomiting is controled by ice compresses to the throat, mustard plaster to stomach, and administration of a rhubard and soda mixture which contains 10 drops of spirits of chloroform to the dose. Water ad libitum on the second day, gruel on the third day, but no milk is given during the first week because of fermentation. Toast and bread and butter is given with gruel after the 4th day and everything but meat by the end of the first week, and a full diet after the second week. Strychnine (1-30 gr.) t. i. d. Enemata every day to bring away a little gas. Morphine gr. ¼ is given immediately after operation. Beginning the fifth night compound cathartic pills are given. The most comfortable position is on the side with the knees drawn up relieving the tension on the wall and sutures. If the patient prefers to be on the back the shoulders and knees are raised. The

Fowler position is used in infectious conditions. Patients are kept abed three weeks.

In the discussion of these papers it was seen that not many of the operators were in favor of Dr. Boldt's radicalism, although it was agreed that in some cases it was essential to have the patient out of bed very early.

J. H. Gibbon (An. of Surgery, August, 1907) deals with the same subject. Morphine (¼ gr.) is given by him as a routine either before anesthetizing or just before the patient recovers consciousness. This with the smaller amount of anesthetic, which is ethyl-chloride-ether sequence in his practice, makes nausea and vomiting much less. Solid food is given to the third day, when the bowels are moved. Previous to this enemata may be given. Patients are allowed up in clean cases on the 8th or 9th day. In discussing this paper J. B. Deaver said that instead of patients usually being neglected they received too much attention. He used ether alone, never has used scopalamine, objects to morphine except very occasionally, and does not like the indiscriminate use of strychnine. His hysterectomies are urged to turn on their side early and are out of bed in a week.

H. W. Vineberg (Surg. Gyn. and Obst., August, 1907) gives his experience with eserin salicylate as a prophylactic against atony of the bowels. He finds it free from danger if given at the end of the operation, but should not be given to patients in which meteorism is present. Thus far the evidences are in favor of its being of some value, especially so to counteract the paralyzing effect of morphine, which is usually necessary in the first hours after a laparatomy.

K. Vogel (Mitt. a. d. Grenz. d. Med. u. Chir. Bd. XVII. Hft. 5), who says he was the first to suggest the use of eserin in 1904, gives the further results of the method. He gives castor oil two days before operation, immediately after operation eserin salicylate (1-60 gr.) is given, one hour later a glycerin enema and the treatment is repeated in 5 or 6 hours. Flatus is passed freely and shortly after the operation the bowels move. Peritoneal adhesions do not form and ileus is prevented.

*Ileus.* In a symposium on ileus at the 1907 meeting of the American Medical Association Lennander discussed the question of *abdominal pain.* Inasmuch as the abdominal viscera are only supplied by sympathetic fibres pain does not originate within them, but does originate in the parietal serous and subserous membranes which are innervated by spinal nerves. Stretching of the parietal and mesenteric attachments of the stomach and intestines as well as strings or band-like adhesions to the abdominal wall, invariably elicit pain, as does anything that displaces the parietal serosa. Pain in intestinal perforation is due to a chemically different substance coming in contact with the serosa. The sensitiveness of the parietal peritoneum increases pari passu with the inflammation, but later decreases when the inflammation reaches a certain high degree. He believes he disproves Nothnagel's hypothesis that colicky pain is due to pressure of the muscular on the nerve ends in the bowel, or that it is due to anemia of the distended loops.

Cannon and Murphy continuing the experimental intestinal observations which have been reported in the past few years, show that *dynamic ileus* can be produced from general asthenia and from inhibitory impulses through the splanchnic. This reflex in the experiments on the etherized animals is induced by crushing the testicles. If, however, the splanchnics were divided there was no reflex paralysis of the stomach and bowel. They previously have shown that exposure of the guts to air and unusual cooling or the administration of ether over a long period did not produce postoperative paralysis, but that the handling of the gut was immediately followed by paralysis even if the splanchnic were divided, which proves to their minds that the paralysis is not reflex from the spinal cord, but due to the disturbances of the local mechanism in the wall of the gut. They have not yet worked out the seat of trouble after section of the gut and suture, or peritonitis, but it would seem that it were central, inasmuch as local stimulants applied to the gut do not urge peristalsis, while on the other hand if the inhibition is central anything that will block the splanchnic impulses, such as physostigmin, will allow the local plexus to work. They found physostigmin salicylate acted well for a short time on those cases where the splanchnic reflex had been induced by crushing the testicle.

*The Technique of Pancreatectomy.*—Desjardins (Revue de Chir., XXXV., No. 6), says that the removal is not incompatible with life. Billroth and Franke have done the only two total pancreatectomies, both with success, and later the patients presented no trouble due to loss of the organ. Many partial pancreatectomies have been performed. Of 30 collected cases, there were 9 partial resections of the tail, all but 3 for malignant tumors. There were 2 complete resections of the head, and these alone, Desjardins calls true pancreatectomies. There was one in which the body of the pancreas was removed, leaving the head, which avoided sectioning the common bile-duct, and left the tail. This was done for a chronic sclerotic pancreatitis.

Of the 30 cases there were 16 operative cures and 14 deaths. Of the 2 total pancreatectomies, both were cured; of the resection of the tail, 7 cures and 3 deaths, of the partial of the head 7 cures and 9 deaths, of the total head 2 deaths. In spite of the good results in Billroth's and Franke's cases, Desjardins does not think that we have a right to do total pancreatectomies, the partial alone being justified by physiology. It is necessary to remove the corresponding part of the duodenum with the head of the pancreas, since both are supplied by the same blood vessels, they are intimately adherent to each other, and it is necessary to remove also the retroduodenal lymph glands. The three dangerous zones are: First where the ascending colon is adherent to the second part of the duodenum. It is necessary here to avoid wounding the colon. The second zone is where the mesenteric arteries emerge from the border of the pancreas, passing in front of the duodenum. The middle colic artery may here be wounded, giving rise to gangrene of the transverse colon. The third danger zone is posterior, where the portal vein and inferior cava are in danger. All three zones can with care be avoided. The careful

detachment of the parts is the key to the success of the operation. The head of the pancreas and the duodenum surrounding it are detached *en bloc,* the duodenum near the pylorus and the beginning of the jejunum being divided between clamps. The common bile duct is divided as near as possible to the duodenum, and the body of the pancreas, including the duct of Wirsung, is divided also. When the removal of the head of the pancreas and the duodenum has been concluded, the pyloric end of the stomach is closed, and the upper cut end of the jejunum is implanted into the stomach, making a gastroenterostomy. The open ends of the common bile duct and the freed end of the duct of Wirsung are implanted into the upper end of the jejunum, one on one side and the other on the other side. The cut face of the pancreas is tied off in sections around its duct for hemostasis. This operation is possible only when the common bile duct and the duct of Wirsung are dilated sufficiently to receive the button of Boari, which is employed to make the connections with the jejunum. In such a case about 30 cm. of the upper end of the jejunum is cut off from the rest, still preserving its attachment of the mesentery. The then upper end of the jejunum is employed for a gastroenterostomy. The isolated piece of jejunum is anastomosed by one end to the gall bladder and by the other end to the cut end of the stump. The bile and pancreas fluid can thus escape only through the new common passageway made up of the isolated portion of jejunum, which is now anastomosed to the remaining jejunum just below its attachment to the stomach. The Mayo Robson cushion to the back is used, and either Kehr's or the author's incision.

*The Treatment of Fistula of the Pancreas.*—Heineke (Zentr. f. Chir., 1907, No. 10).—The duration of fistulæ aften opening a pancreatic cyst or draining a ruptured pancreas and the excoriation accompanying, make very trying conditions to deal with. To avoid the maceration of the skin and also to shorten the time of healing, the hydraulic empyema apparatus of Perthes is used. The eventual closure of the fistula is brought about by using the suggestion of Wohlgemuth, who found that with a fat diet the secretion was lessened, with a proteid diet the secretion was increased while with a carbohydrate free diet the secretion was practically stopped. Further he noted that with an acid the secretion was increased while alkalies decreased the flow. A combination of a diabetic diet with small doses of sodium bicarbonate decreased the flow and allowed a fistula to close in a very short time. A case is reported of a traumatic rupture of the pancreas drained through the gastrocolic omentum, that secreted 500 c.c. a day for a time, then closed spontaneously for a day, to again break open and discharge from 50 to 100 c.c. a day. Three days after beginning a carbohydrate free diet the fistula closed.

*Perineal Extirpation of Cancer of the Anus and Rectum.*—Dolore and Chalier (Revue de Chir., XXXV., No. 5) says that the operation for artificial anus should be reserved for inoperable cases, and that these are being diminished in number as time goes on. Without passing judgment on the sacral method of Kraske, or the abdominoperineal operation, Delore and Chalier believe that the perineal route, or, better, the coccy-

perineal, sufficient in the great majority of cases, if they are attacked early, and that it is available for the anorectal cancers or the cancers of the rectum proper, even the more extensive cases, such as the diffuse cases, the supra-ampullary and certain varieties of the rectosigmoid cancers. Delore and Chalier have operated on 19 cases, 2 of which were epitheliomas limited to the anus, 6 diffuse anorectal epitheliomas, and 11 cancers localized to the rectum (7 of the ampulla and 4 supra-ampullary); 2 were simply excised without amputation of the anus or rectum. The coccyperineal operation permits the wide and sufficient removal of the growth in the majority of cases, without the multilation of the Kraske or the dangers of the abdominoperineal operation. A temporary artificial anus was performed in one case and gave perfect results. They did not employ it more frequently because of the difficulty in obtaining the patient's consent. They are not in favor of a permanent iliac anus, to obviate the difficulties of an incontinent perineal anus. They believe that the latter is better than a partially continent iliac anus. If the anal cancer is large and extends into the rectum, it will often be serviceable to curette and cauterize the external protuberant portion as a preliminary operation. This will permit more easy and thorough asepsis of the region and closure of the anus at the time of the operation.

The lithotomy position is employed. The incision surrounds the anus and extends forward in the median line a short distance, and backward to the coccyx, which is excised. The rectum with the invaded tissue and the sacral lymph glands are liberated en masse. This can be done up to the promontory of the sacrum posteriorly. The rectum is then liberated anteriorly, high up. The vagina can, with care, often be saved. By drawing down the mass the peritoneum is exposed anteriorly and opened with scissors, when gauze is introduced to protect the peritoneal cavity. The sheath of the rectum and the surrounding tissue are then divided, and by a sort of unsheathing of the rectum the mass can be brought down farther. The anterior cul-de-sac of peritoneum is then closed by suturing the cut edges of peritoneum in front to that of the pelvic colon drawn down. The intestine is then cut between forceps, the lower end with the mass is dissected out, and the upper cut end brought down and sutured to the skin about in the position of the normal anus. Iodoform gauze is used for drainage in front of and behind the rectum, and a rubber tube and gauze are introduced into the rectum. The operative mortality in the 19 cases was 10.5 per cent. So far as the late results could be ascertained they were very good as to duration of life. One woman, sixty-eight years old at the time of operation, was free from recurrence eight years later.

*Results of Radical Operation for the Cure of Breast Carcinoma.*—Halsted (Ann. of Surg., July, 1907). The paper is in part statistical, but much space is given to general consideration of the subject. Two hundred and ten traced cases, operated upon more than three years before, form the material for study. The percentage of cures (using the three years limit) was 42.3. Of the pathologic varieties the adenocarcinoma offered the best results, 75 per cent of the cases being cured; while large infiltrating scirrhus, which numbered the most cases, was

hard to cope with, only 35.5 per cent being cured. In sixty-four cases no glandular involvement was discovered after the most careful search, yet in fifteen of these there was metastasis or recurrence of some sort sooner or later—in six, three years after operation. The percentage of cures for three years for this group was eighty-five. Of 110 cases with the axilla involved and a negative neck, there was 24 per cent cured. Of the group with the glands of the axilla and neck both involved, five cases remained well three years and thirty-four were not cured. The supraclavicular operation was urged in all cases with palpable operable neck involvement, or when the apex of the surgical axilla is involved. When midaxillary involvement is demonstrated the neck is almost certainly involved and should be cleaned of all its lymphatics as high as the bifurcation of the carotid. The neck operation can be omitted in hopeless cases, in most "duct cancers" and in adenocarcinoma when the axilla is uninvolved. The operation mortality in 232 cases was 1.7 per cent.

Halsted is convinced that cancer of the breast is but very rarely disseminated by blood vessels, but the growth is spread centrifugally along fascial planes, even reaching the bones by permeation, the bones involved being those beneath the surface involvement, the forearms and lower legs being practically free.

In operating on "cancer cysts" it is absolutely essential that the diagnosis be made on the operating table by the surgeon noting the barely thickened point, the slight lack of luster, the faintest difference in color and in texture, and his suspicions should be aroused by the presence of blood-stained fluid. If the cancer is diagnosed and a complete operation done upon these cysts the results are the best in breast surgery, but if a complete operation is not done until later the prognosis is hopeless.

As cases are coming to the surgeon earlier than ever before, the diagnosis of these earliest cases becomes a refinement which requires great care and precision and the cases must be studied longer and more carefully, and our suspicions aroused when there is the slightest limitation of the excursion of the skin over the breast with the nodule as compared with the healthier organ, and in suspicious cases exploratory incisions should be made, not into the growth but down to it, and a diagnosis made from the fibrous appearance and shortening of the surrounding trabeculæ. In scirrhus the disease may be active and metastasis occur long before the visible or palpable tumor is developed.

To close the breast wound more or less regularly by any plastic method is hazardous and should be vigorously discountenanced. Remove a large circle of skin and graft the defect if the wound cannot be closed. After incomplete operations the local manifestations of recurrence are almost invariably deplorable and the prognosis hopeless, and recurrences are relatively later when vigorous chemical caustic or actual cauterizing has been employed.

He is of the opinion that toxins are generated by the cancer and cause disseminated pains in knees, legs, arms and back which suggest cancerous involvement and that by removing the growth these pains are lessened. There is also a reactionary, boardlike edema of the pectoral

region occasioned by the presence of an undemonstrable growth which is later followed by rapid cancer growth.

*Carcinoma of the Breast.*—Greenough, Simmons, Barney (An. of Surg., July, 1907).—Out of over 400 cases of primary operations for cancer of the breast at the Massachusetts Hospital from 1894 to 1903, inclusive, 376 were traced to a conclusive end result at an average period of eight years after operation. Sixty-four cases were alive and well and seven died without recurrence, over three years after operation. Counting in the operative mortality, there were 320 attempts at radical cure, sixty-seven of which, or 20.9 per cent, were successful. During this same period palliative operations were performed on fifty-six patients (15 per cent), and fifty-two cases were discharged untreated. Cases in which the tumor was ulcerated, or was adherent to the skin or to the chest wall, and cases in which the axillary glands were palpably enlarged, gave notably less promising results than when these conditions did not exist. No cases with palpably enlarged cancerous glands above the clavicle, and no case of cancer of both breasts, was cured. Medullary carcinoma was more grave than that of the scirrhus type, and adenocarcinoma and colloid were relatively of a far less malignant type. The duration of the disease, other than in the individual case, exerted little influence on prognosis. Extensive operations with wide removal of the skin gave the greatest freedom from local recurrence. Removal of the pectoralis minor appeared to be of slight significance. Incomplete operations on early cases yielded better results than extensive operations in cases which were well advanced. Recurrence in the scar occurred in less than one-half of the cases. Internal metastasis was most frequent in the lungs, mediastinum, in the axillary and supraclavicular glands, the liver and the spleen. Seventeen out of eighty-eight cases, or 19 per cent of those passing the three year limit without evidence of recurrence showed recurrence later, and four cases developed recurrence six years or more after the operation.

*End Results Following Operations for Carcinoma of the Breast.*—Meyer (Surg. Gyn. Obst., July, 1907).—The author's statistics for operations done over three years before are compiled from sixty-three cases. Of this number twenty-eight lived from 3 to 12½ years after the operation (44 per cent). In one case of this series death from diabetic coma followed the operation. The author's complete operation was performed, the axillary contents and both pectoral muscles being removed. He does not believe it desirable to clean out the supraclavicular space at the time of the first operation, as in none of the thirteen patients that remained well from 5 to 12½ years were the supraclavicular glands removed. Edema of the arm has been noted in about 10 per cent of the cases and was then of a transient nature, due to the cicatrix, but in only one case did it persist. The post-operative neuralgia or neuritis of the brachial plexus has been temporary in every instance. If the disease has reached the supraclavicular nodes, there is little hope for a longer freedom from recurrence, as every case operated upon died soon after. If the breast is involved in the upper two quadrants, particularly if it involves the skin, the infection of the supra-

clavicular glands may be expected. He does not believe, however, that radical operation should be refused unless metastasis forbid. Radical operation should not spare skin, and for this reason he does not accept plastic operations, and even doubtful cases, he believes, far better by radical procedure than by an operation of less magnitude, or undue temporizing.

*Carcinoma of the Breast.*—Cabot (Ann. of Surg., July, 1907). His report is based on 42 cases in private practice. Of these nine are alive today. One case 19 years, and one case 14 years, one case 11 years and two cases 10 years, and one case each for 8, 7, 5 and 4 years. These non-recurrent cases were tumors of a mild type, 3 adenocarcinomas, 3 small scirrhus, one small plexiform medullary, one Paget's disease. In six of the cases glandular involvement was not found. From studying this small series of cases the author believes that the question of recurrence depends more on the character of the growth and the degree of involvement of the lymphatics than on the thoroughness of removal, as in 7 of the 9 the muscles were not removed. However, he believes that this should not be used as an argument against extensive radical operations, for it is impossible to tell how far the cancer cells have gone at the time of operation. He notes one case of a small nodule, situated in the center of the gland, in which he spared the pectoral muscle, but it was in the muscle that recurrence occurred, and since that he has removed the muscle in all cases.

*Cancer of the Breast and its Operative Permanent Cure.*—Finsterer (Deut. Ztschr. f. Chir., 1907, Bd. LXXXIX., p. 143) says that of the cancers of the breast operated on from 1877 to 1903, there was 12.5 per cent of permanent cures. In the last eight years the percentage increased to 24.64. The extent of the operation was always made to depend upon the local findings. The best method of operation is that which diminishes the general as well as the number of local recurrences, as by the most exact removal of lymph glands it diminishes the occurrence of metastases. An extensive removal of the overlying skin should receive close attention. The supraclavicular fossa should be cleaned out in every case, and absolutely so when during the operation the infraclavicular glands are found to be diseased or are considered to be suspicious. The question as to whether in the presence of demonstrable disease of the supraclavicular glands an operation is or is not justified, needs more exact examination. Cases are known which contradict the rule of simultaneous involvement of the supraclavicular and intrathoracic glands and pleura. To decide some cases, one must take into consideration the duration of the disease, the size and situation of the tumor (whether it involves the inner or the outer half of the mamma), the size and possible growth of the supraclavicular glands. On account of the frequency of late recurrences, the time limit of permanent cure should be increased to five years, and for the determination of the results, the ability of the patient to work should be taken into account.

*End Results in Operation for Cancer of the Breast.*—Dennis (Surg. Gy. Obs., July, 1907). Out of his large material 50 cases which passed the three-year limit were selected, but the author feels that this is much

too short a limit to use to predict a permanent cure. By following all these cases after operation he shows that cancer of the breast is sometimes permanently cured, or at least 25 years have elapsed with no evidence of return; that the cases may go as long as 18 years, and yet finally have a return in some other organ; that in the cases that had no return the operation was performed within six months from the incipiency of the disease, thus showing the importance of early operation; that the more radical the operation within reasonable limits the better the prognosis. He believes that in some cases in which the outlook is most unfavorable, as manifested by extensive hemorrhage and widespread axillary involvement, the end results have been entirely satisfactory.

*Goitre.*—Crile (Lancet Clinic, Dec. 7, 1907) directs attention to the great improvement in results of operation upon the thyroid, which he says is due to (1) the improved technique (there are few operations in which the result is so definitely due to the technique as in operations on the thyroid), (2) that the greater number are presented during the time that they are still fair surgical risks, (3) that the importance of the parathyroids has been recognized, (4) that in Graves' disease surgeons have found by increased experience that operations require the greatest gentleness and precision, that the operation must be fashioned according to the gravity of the case, that cases must be suitably prepared for operation and that unless a patient can be finally brought into a physical state of a fair risk operation must be deferred. He emphasizes the importance of the removal of thyroids that are enlarging during the cancer period of life as 10 per cent of his cases have been malignant. In Graves' disease of severe variety he recommends first trying Beebe's serum, which is to be repeated if there is a relapse. If the case does not respond to the serum use the Kocher method of gradual approach to the operation, and the progressive surgical treatment as it seems safe. He believes excision is the solution of the relief, and that if the Graves' disease itself is not due to pathological alterations in the thyroid gland, the thyroid gland at least is one link in the chain of causes, and the cycle is broken permanently by thyroidectomy. In such cases as are profoundly toxic the suggestion is made to bleed the patient and then directly transfuse blood. He has operated 157 times upon the thyroid, in the last 101 cases without a fatality.

*Notes on Thyroid Tumors.*—Barker (Practitioner, Sept., 1907).—In considering the kind of anesthesia to use in removing thyroid tumors the choice is given to a local anesthetic which gives a most effective analgesia, and is applied by a method rather different from that ordinarily practiced. A two per thousand of B. Eucaine in normal saline is prepared fresh by adding a powder containing 3 grains of sodium chloride to 3½ ounces of water, which is boiled in a glass flask for a few minutes, then cooled to blood heat. To this, when cooled, is added 10 drops of 1-1000 adrenal chloride. A line following Kocher's incision is injected in the skin with an ordinary hypodermic needle. A blunt, probe-pointed, long needle is then used, with a lateral opening near the point. It is thrust through a small opening into the subcutaneous tissues and about 30 c.c. of the solution is injected across the neck; then the solution is in-

jected upward, outward and downward from the outer end of the incision. The fluid thus diffused will cause an artifical edema, which will cross the track of most of the cervical nerves supplying the skin in the field of operation. A further injection is made around the capsule of the gland on both sides. These injections, which may use as much as 150 c.c. of fluid, are made with the patient in bed in the ward. At the end of 40 minutes the anesthesia is at its height and the patient is removed to the operating room where, with a nervous case, after a preliminary injection of morphine, the operation is done without pain in an area which has entirely lost its edema, and the field is practically bloodless. Adrenalin delays the effect of B. Eucaine, but prolongs it up to two and a half hours. He reports twenty-two thyroid operations; every one healed without a flaw, in most without any drainage. It is also noted that hardly any ligatures were employed.

*Surgery of the Thyroid.*—Ferguson (Med. Herald, May, 1907).—He believes that surgical intervention in all but exophthalmic cases should only be followed after other methods have failed to relieve the patient of symptoms incident to the enlargement. In 300 cases he found that thyroidectomy was done for dyspnoea in 77 per cent, for deformity in 24 per cent, dysphagia in 8 per cent, tracheal stenosis in 3 per cent, for malignancy in 2 per cent. In a third of the cases a multiplicity of signs and symptoms was the indication. He gathers from Kocher's work the importance of the condition of the cardio-vascular system in determining operation, and seconds the sound advice of Kocher, not to operate in Graves' disease as a last resort. Kocher's exophthalmic cases operated numbered 176 with a 5 per cent mortality; 158 were traced after operation, 81 per cent were cured, 7 per cent greatly improved, 10 per cent improved and two died. The mortality in other hands is 15 per cent, 8.66 per cent, 28.5 per cent. Ferguson has operated on 58 cases, 44 simple or cystic goitres, without a death, 12 exophthalmic cases were 4 deaths, and 2 malignant cases. Eight of the exophthalmic cases were cured. The simple cases may have the wounds closed, but in exophthalmic or malignant cases the wounds are drained with rubber tissue wicks.

*Surgical Treatment of Exophthalmic Goitre.*—A. Kocher (J. A. M. A., Oct. 12, 1907).—Out of 3,460 goitre operations at Berne 315 have been done on 254 patients with exophthalmic goitre. Of the last ninety-one operations performed on sixty-three patients there has not been a death, and of all the 254 patients only nine have died (3.5%). The improvement in death rate is not because severe cases have been refused, but because more prudence has been observed in operating, the technique has been improved, and the various operative procedures, such as ligating the arteries or excision, are done at different sittings. The strength of the heart is considered of the greatest importance. In many cases it is dilated, and if there is compensatory hypertrophy due to tachycardia, blood pressure is increased. A blood pressure of 105 c.m. does not forbid operation if the pressure is proportional to the degree and constancy of the tachycardia. If a marked development of the disease exists with low blood pressure which after exertion is followed by marked cardiac dilation and unmeasurable blood pressure, the case is never submitted to an im-

mediate operation. In a highly vascular gland with marked symptoms, the patient is prepared merely for a slight operation. In fifty-eight cases the blood was carefully studied and showed a marked increase in the number of lymphocytes and a decrease in the polynuclears. The increase of lymphocytes is proportional to the degree of the disease, and if there is no increase of lymphocytes the case is a serious one. Only in early undeveloped cases, or the late cured ones, is the lymphocytosis absent. The operation performed by Kocher is usually the enucleation of one lobe. Inasmuch as increased vascularization is necessary for the increase of the disease, ligation of the arteries is sometimes done alone, and sometimes in conjunction with partial excision. There has not been a single case in which the patient has not been benefited by operation. In all cases there has been 83 per cent of cures. There are 73 per cent of cures in the patients with the primary disease; 92 per cent of the cases having the disease combined with ordinary goitre, and 100 per cent of the patients with vascular goitres. Some of the observations date back seventeen years, and in some of the most severe cases it took a long time before the heart and eyes became normal. Those coming to operation after a long duration of the disease and secondary changes had taken place, were the hardest to cure. Ten cases were not benefited much, but in them there were symptoms of other diseases.

With careful preliminary observation it was found possible to operate in nearly every case. Repeated operations, with patients under observation in the meantime, are necessary in some cases. More than two arteries should never be ligated at one sitting. To remove more than half the gland at one sitting is dangerous, and it is rare that this is ever wanted. In the presence of distinct vascular symptoms one should operate immediately, ligating two arteries, or excising half of the gland. When at the height of the distressing disease, operation is not advisable. Operation is best done under cocaine. Immediate post-operative increase of disease is thought to come from expression of toxin in the gland.

*Serum Treatment of Exophthalmic Goitre.*—F. S. Bulkeley (N. Y. Med. J., Nov. 9, 1907), gives a careful review of the literature of this subject, and reports one personal case in which the serum gave very doubtful results. In this case, goitre was slight, tachycardia and tremor well marked, exophthalmos absent, and the other symptoms those usual in such cases. The thyroid was palpable and visible, but at the same time was no larger than is common in many healthy women. Thyroidectin was used in increasing doses. For a time it seemed to be of some benefit, but this effect was soon lost; in fact, it seemed to aggravate the symptoms. Later, Moebius serum was tried with practically the same results. Quinine hydrobromate was used for about five months, in doses just under that necessary to produce cinchonism. It seems to give positive results. The author notes that in the majority of reported cases not enough details are given to enable the reader to judge of the probability of cure or permanency of results. He sees no certainty of even the palliative action of the serum. The assertion has been made that the sera occupy the same relation to exophthalmic goitre that thyroid extract

doses to myxedema, but we can hardly accept this statement on the basis of the evidence furnished.

*Roentgen Treatment of Exophthalmic Goitre.*—Freund (Muench Med. Wochen. LIV., No. 17) reviews the experience of others in this line, citing nearly a dozen authors, and then reports five cases. The Roentgen treatment gave unmistakable benefit in all. The thyroid gland was reduced in size and as it subsided the nervous symptoms vanished with it and in two cases the systolic murmurs also. The patients all increased in weight. Two have been under observation for fifteen months without signs of recurrence. The Roentgen rays meet the causal indication by restoring normal conditions in the enlarged and morbidly secreting thyroid. They always exert a favorable influence on the nervous manifestations, while they are liable to effect favorably the heart murmurs, struma and exophthalmos. The soft, vascular tumors are the most readily influenced, and the prognosis is better the more recent the goitre. In one of his cases the patient was a young woman and the symptoms had attracted attention about six months before. Little improvement was observed under medical treatment for a couple of months, and two Roentgen exposures were made with a week's interval, with a moderately soft tube, 20 cm. distant, the exposure lasting eight or ten minutes. The struma rapidly subsided and no murmur or tremor could then be detected. There were no ocular symptoms at any time. In another case three exposures were made in the course of a week. In another, four in less than three weeks.

*Incomplete Occlusion of the Abdominal and Thoracic Aorta by Metal Bands.*—Halsted (Jour. Am. Med. Assn., Dec. 29, 1907). An aluminum band is used which can be manipulated either by an instrument or by the fingers to encircle a vessel, either completely or partially occluding the lumen. The bands were used experimentally on 100 dogs, and it was shown that the blood pressure below the band varied with the amount of occlusion. Partially occluding bands produce no macroscopic change in the vessel wall even after months, but when the lumen is almost but not occluded, complete occlusion may result spontaneously, and gives the ideal closure of an artery. In about three months after operation a large extra-dural pad of fat was noted in the spinal cord below the site of occlusion of the aorta. Partial occlusion of the large vessels can be used as a cure for aneurism. Dr. Halsted has successfully used the metal bands in the human subject, once partially occluding the innominate, the common carotid four times, and once to completely occlude the femoral. The use of ligatures in large vessels is usually followed by cutting through and secondary hemorrhage.

*Concerning Ligature of the Common Carotid. A New Method of Ascertaining the Possible Disturbance of the Circulation.*—Jordan (Arch. f. Chir., 1907), says that in 25 per cent of the cases reported by Pilz, Zimmermann and Krankepuhl, brain disturbances occurred, and 10 per cent died. Since we cannot ascertain how abundant are the collateral vessels, nor their capacity for dilatation, it is always difficult to determine the prognosis of a ligature of this vessel. To overcome this difficulty Jordan recommends a method which he has tried, successfully, on ani-

mals and in one case on man, i. e., the previous temporary, not firm ligature of the carotid for forty-eight hours. Since the brain symptoms dependent upon a lack of nourishment to the brain occur immediately after the operation; at the end of the first or in the course of the second twenty-four hours, if no trouble from the ligature occurs during this time, it is unlikely that there will be any grave consequence from occlusion of the carotid.

Experiments on lower animals show that the ligature did no damage to the intima. Senger, in 1895, employed the temporary ligature for the bloodless extirpation of a tumor of the thigh. The operation should be done under local anesthesia, in order that the effect on the brain may be observed, and the ligature withdrawn on the first appearance of any distinct symptoms. The ligature material may be a small linen band, a rubber band, catgut, or a forceps with its blades guarded with rubber covering. The chief point is to apply the constriction very carefully, until the temporal pulse disappears. A further indication for this procedure is to be found in the suture of arteries.

*The Technique of Direct Transfusion of Blood.*—Crile (Annals of Surgery, 1907) bases his remarks on 225 experiments upon animals and 32 clinical cases. The blood was transferred from the artery of the donor to the vein of the recipient. In the clinical transfusion the radial artery of the donor and the proximal end of any superficial vein of the arm of the recipient were employed. Unless contra-indicated, both patients are given a hypodermic injection of morphine twenty minutes before the transfusion begins. The donor is placed on a Trendelenburg table, so that if he should become faint the head may be readily lowered. The recipient is placed upon an operating table with his head in the opposite direction. Infiltration anesthesia of 0.1 per cent cocaine solution is employed, and the radial artery is exposed. A Crile clamp is applied to the proximal end of the artery and the distal end is ligated; the artery is divided; the adventitia pulled over the free end as far as possible and closely snipped off; a moist sponge now covers this field; 3 or 4 cm. of a superficial vein of the recipient is then likewise freed; the distal part ligated, the proximal closed with a Crile clamp; the distal part is divided with scissors, the adventitia drawn out as far as possible and closely snipped off; the vessels are then inspected, and a canula whose bore is larger than the actual tissue thickness of either vein or artery is selected. The vein may then be pushed through this tube, after which the freed end is turned back like a cuff and snugly tied in the second groove. The artery is then drawn over the vein and tied in the first groove with a small linen ligature. This completes the anastomosis. The clamp is then removed from the vein, afterward, gradually, from the artery, when the blood stream will be seen to pass from the artery across to the vein, dilating the latter. By this method intima comes in contact with intima, and the blood is transferred without clotting. The blood lost by the donor is regained in from four to five days, and the amount transferred is under the immediate control of the operator. The rate of transference should be carefully gauged, because of the risk of overcharging the pulmonary circulation.

# BOOK REVIEWS.

MODERN CLINICAL MEDICINE.—INFECTIOUS DISEASES. Edited by J. C. Wilson, A. M., M. D. An Authorized Translation from "Die Deutsche Klinik" under the general editorial supervision of Julius L. Salinger, M. D. New York and London: D. Appleton & Co., 1905.

The appearance of "Die Deutsche Klinik" must be regarded as marking an epoch in the history of medical writing. The most eminent German clinicians have united in the attempt to produce an adequate presentation of the state of medical knowledge at the beginning of the twentieth century. The object of the series of volumes seems to be not so much an exhaustive account of all that is known of the various diseases but rather a critical discussion of our present point of view and of the problems still awaiting solution. Strange as it may seem, the English translation is in some ways decidedly superior to the German original. It contains all that "Die Deutsche Klinik" does, as well as many emendations on the part of the editors and additional chapters on subjects that were not treated in the original. Thus the first volume of the series on Infectious Diseases contains articles on Vaccinia, Varicella, Dengue, Yellow Fever, Weil's Disease and Malta Fever, by J. C. Wilson, that do not appear in "Die Deutsche Klinik." Among the Germans, F. Klemperer and Liebermeister discuss typhoid; Loeffler, malaria; Heubner, measles and scarlatina; Baginsky, diphtheria, and so on down the list.

DIE BEHANDLUNG DER TUBERKULOSEN. Wirbelsaulentzundung von Dr. F. Calot. Verlag von Ferdinand Enke, Stuttgart.

This work is translated by Dr. Ewald, assistant to Prof. Volpius at Heidelberg, and contains a preface written by Dr. Volpius. From Calot we have had several valuable books and pamphlets, giving in detail the treatment instituted by him at the Rothschild Hospital and at Berck. Dr. Calot's works always bear the earmarks of extreme care for detail. This present volume consists of 90 pages, profusely illustrated, on the subject of "Tuberculous Diseases of the Vertebrae." It is especially valuable in that it gives minute instruction as to the preparation of plaster of Paris bandages and their application. The treatment of abscesses is thoroughly described.


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